APRIL 14, 1952

STEEL

THE WEEKLY MAGAZINE OF METALWORKING

STEEL PROFITS: THE FACTS
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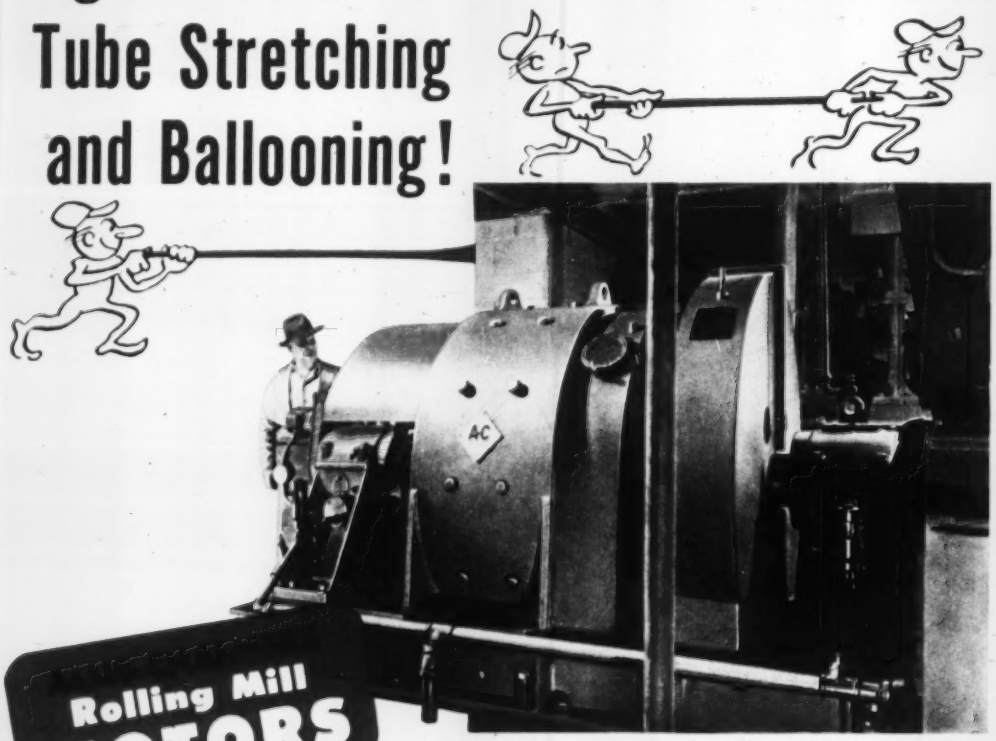
Buyers have had a decade of trouble. To learn how one tackles his problems, see p. 74

Engineered to **Prevent** Excessive Tube Stretching and Ballooning!



One of two 600-hp motors used on Foren mill rolling hot-finished tubing from pierced billets.

IN CLOSE-COUPLED TUBE MILLS, off-gauge production due to stretching and lost production due to ballooning can be prevented only by obtaining full speed coordination between stands.

One of the essentials for such speed coordination is low impact speed drop. The 600-hp, 690/1380-rpm direct-current motor shown above gains this objective by a combination of mechanical and electrical design features.

Mechanically, the motor itself is of high inertia design, with a very high peripheral speed. In addition, it is provided with a separate flywheel for added stability.

Further assurance of low impact speed drop results from electrical characteristics made to give low resistance and low inductance. This tends to reduce the transient change in speed when load is applied.

Used on Foren Tube Mill

Two of these 600-hp motors were installed by *Globe Steel Tubes Company* of Milwaukee when they revamped their Foren Mill in 1951.

When the mill was placed in operation 20 years ago, it was one of the first of its kind in the world and had three times the speed of older mills. This high speed was the result of close coordination in mill, motor and control design — with Allis-Chalmers being called in to engineer and supply both the original motors and the control.

Now, using fewer stands and larger motors, the revamped mill is powered by 11 Allis-Chalmers motors totalling 2453 hp, plus a 200-hp bar extractor drive.

CHECK YOUR NEEDS

For more information about custom-engineered large dc motors, including an explanation of the Frog-Leg *winding, ask your nearby A-C representative for Bulletin 05B6002A. Or write to Allis-Chalmers, Milwaukee 1, Wisconsin.*

A-3594

Frog Leg is an Allis-Chalmers trademark.

ALLIS-CHALMERS

Even today you may see here and there a steel plant with a big scrap pile. "Look at all that scrap!" you say. "Why the talk about a scrap shortage?"

Just a minute! The chances are, that big pile is only a few days' supply. For it takes on the average a half ton of scrap to make a ton of steel. To keep the steel mills of the country operating at capacity calls for 95,000 *tons of purchased scrap every day*.

That's why it's so urgent to move the millions of tons of forgotten scrap that's snagged up in plants and factories and on farms all over the country. Freeing that dormant scrap to build up the steel mills' scrap piles would mean a far brighter steel supply picture, with more steel for everybody. So make a systematic check of your plant for dormant scrap, and then call in a scrap dealer!

SCRAPPY SAYS: AID DEFENSE MORE SCRAP TODAY... MORE STEEL TOMORROW

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More Scrap Today... More Steel Tomorrow

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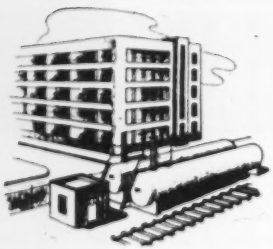
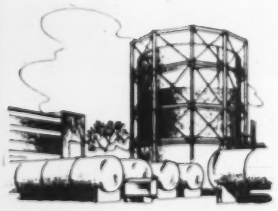


FOR INDUSTRIES

Leading industries use Phillips *66* Philgas successfully for heat treating, mold drying, core baking, ceramic firing and many, many other operations. Automatic Philgas systems assure constant furnace temperatures and atmospheres; constant pressures, high or low.



FOR UTILITIES

Many progressive utilities use Phillips *66* Philgas to augment natural or manufactured gas. High-quality Philgas is uniform in thermal value and gravity, and is free from harmful contaminants. Automatic operation cuts down on overhead.

*Philgas is the Phillips Petroleum Company brand name for its high quality propane-butane LP-Gas or bottled gas.

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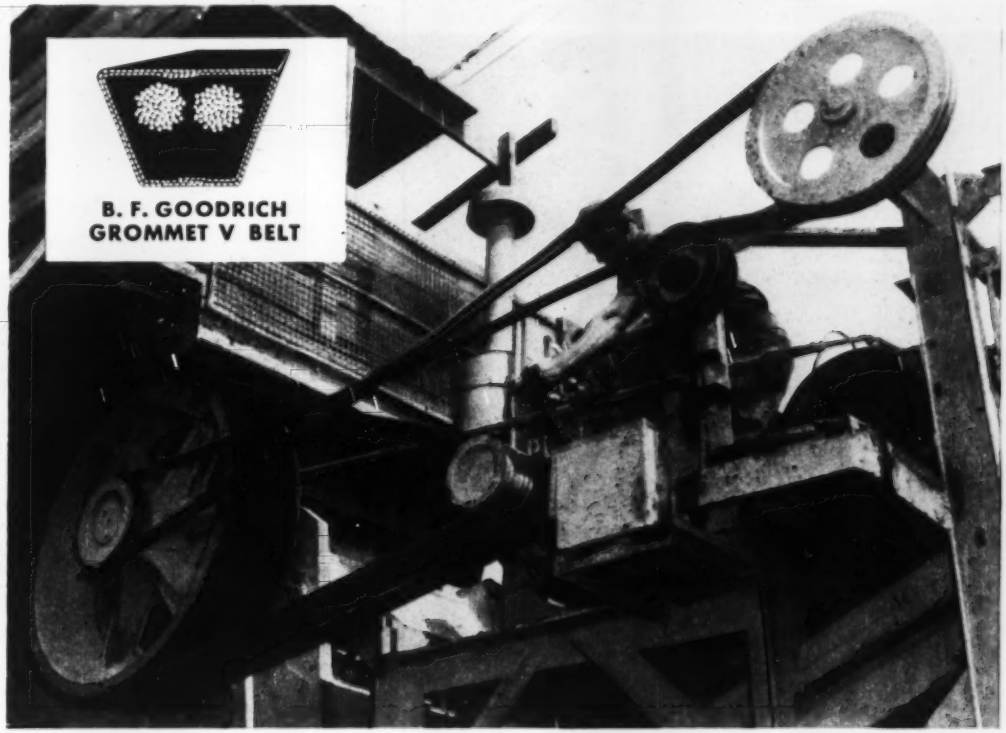
RESEARCH KEEPS **B.F.Goodrich** FIRST IN RUBBER



Three years at hard labor for B. F. Goodrich grommet belts

B. F. Goodrich grommet V belts cut costs 20 to 50%

POUNDING action of this machine put terrific shock and strain on the V belts. Belts are outdoors, have to stand rain, dust and dampness. When belts wore out, work stopped—costs went up by the minute.

Then a B. F. Goodrich man suggested using B. F. Goodrich grommet V belts. When the picture above was taken, the grommet belts had been in use 3 years, and looked good for a lot more service. BFG grommet belts look the same as ordinary belts but, because they are made in an entirely different way, grommet belts stand more shocks and heavier loads than any other kind. Here's why:

No cord ends—A grommet is endless, made by winding heavy cord on itself to form an endless loop. It has no overlapping ends. Because most of the failures in ordinary V belts occur in the region where cords overlap, the endless cord section in a grommet V belt eliminates such failures.

Concentrated cord strength—All of the cord material in a B. F. Goodrich grommet multiple-V belt is *concentrated* in twin grommets, positioned close to the driving faces of the pulley. No layers of cords to rub against one another and generate heat; cord and adhesion failures are reduced.

Better grip, less slip— Because a grommet is endless, a grommet V belt is more flexible, grips the pulleys better. Size for size, grommet multiple-V belts will give ⅓ more gripping power, pull heavier loads with a higher safety factor.

Only B. F. Goodrich has the grommet!— No other multiple-V belt is a grommet V belt (U. S. Patent No. 2,233,294). Now available in C, D and E sections. See your local B. F. Goodrich distributor. *The B. F. Goodrich Company, Industrial & General Products Division, Akron, Ohio.*

Grommet V Belts BY
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This Week in Metalworking

STEEL

Vol. 130 No. 15 April 14, 1952

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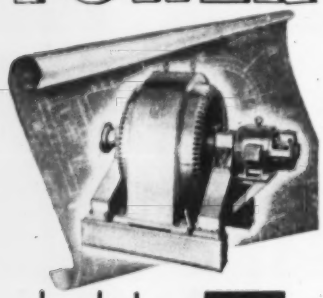

look to... EP

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X-14

Behind the Scenes...

Cover Story

That hand in the cover photograph which is extended so intriguingly belongs to Jacques Stanitz, chief products development and design engineer for Mullins Mfg. Corp. Mullins Photographer Zoda Cola caught the picture just as Mr. Stanitz was explaining the intricacies of a part to Director of Purchases James W. Farrell whose day, STEEL chronicles in this issue's cover story (p. 74).

STEEL editors found this assignment one of the most pleasant they have worked on in a long while. They descended upon Mr. Farrell about 9:30 in the morning of April Fool's Day. He was too polite to say he suspected the interview was all a joke in keeping with the day, but the editors thought they detected an occasional slight uneasiness in his manner as they dogged his footsteps.

But by lunchtime, the reserve had disappeared and he enjoyed the succeeding hours.

Profitable

It's not really so bad, cleaning out your desk. We finally got around to the job and spent an instructive hour or so. We found an old 1948 World Almanac and before we threw it away we learned that the 1929 crash occurred on Oct. 29; that there's an outfit called the Improved Order of the Great Council of the U. S. Red Men, with headquarters in Philadelphia; and that in 1944 3,337 people in Yellow Medicine County, Minnesota, voted for Thomas E. Dewey.

Buried in a bottom desk drawer we found a pair of rubbers we thought we had lost a year ago. Mixed in a box of paper clips we unearthed a dime and two pennies. In an address book we found two three-cent stamps. All in all, a most profitable house cleaning.

Gift

Northwest Metal Products Inc. has just sent us a gift, a miniature wheelbarrow that's an exact scale model of the garden type the company sells. The miniature doubles as a lighter. Geraldine, a cleaning woman in the building and our night editor, was intrigued with the gadget. "Only trouble is, I don't smoke," she said. We don't either, but our visitors invariably do.

We have no moral scruples about other people smoking, but we occasionally are amazed at smoking etiquette: Why do some people blow smoke in your face? Why do they leave a cigarette butt still burning in your ash tray on the desk? Why do some insist on grinding out butts on your tiled floor?

Turn About

Standard Pressed Steel Co., Jenkintown, Pa., turned the tables and is conducting a "Smoking Allowed" campaign. The idea is to encourage the art of smoking neatly among its 2000 employees. Booklets and posters around the plant dedicated to that idea are having results, the company says.

Bronzed

Several of the editors look like they just got back from a month of basking in the Florida sun. We inquired how they got that bronzed look. The answer is simple:

They've installed a Westinghouse sun lamp unit to replace one of the regular fluorescent tubes in the lighting fixture above their desks. By sitting at their desks day after day they acquire a fine outdoor look. What's more, one editor claims the lamp has arrested a case of baldness.

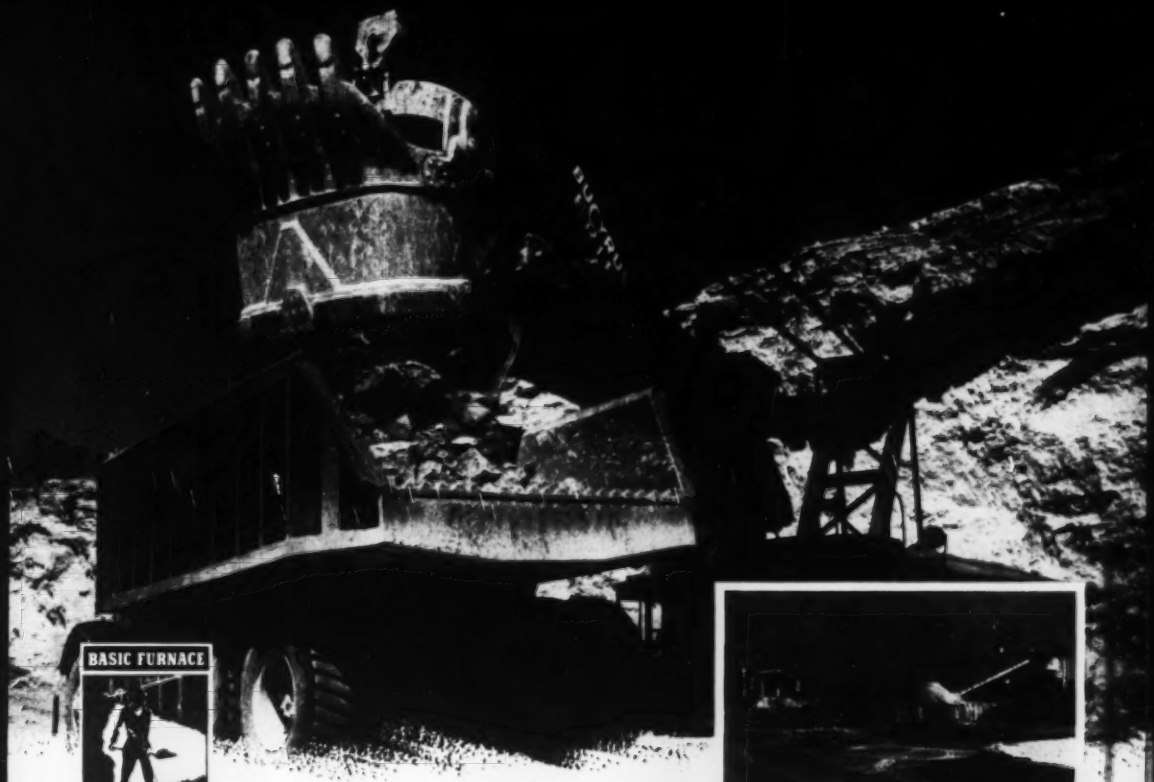
Puzzle Corner

Al Jones and Ben Smith arrived at their destinations at 7 p.m. First in with correct answers to that Mar. 31 puzzle were W. J. O. Kray of Kleenaire Corp., Robert W. Huff of Canton, O., and T. S. Bean of Barber & Ross Co.

The puzzle for this week was submitted by Arthur M. Scott of New Orleans. A surveying party leaves its camp one morning and runs a line due south for a distance of 8 miles, 6 furlongs, 6 rods and 2 chains. Then they head due east and run another line for 13 miles, 7 furlongs, 8 rods and 2 chains. At this point a bear was sighted. Then they return to camp by the shortest route and find they have travelled a total distance of 31 miles, 3 furlongs, 21 rods and 2 chains. What was the color of the bear?

Shrdlu

(Metalworking Outlook—Page 55)



BASIC FURNACE REFRACTORIES

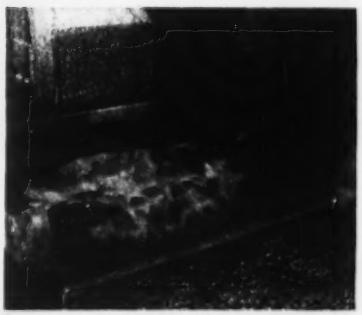
It takes only four passes of the shovel to load 24 tons of dolomite. Four big diesel trucks like this one haul rock to the primary crusher, each making an average of 80 trips a day.

This is the ore production line—primary crusher (60 feet below the quarry floor), belt conveyor to 50,000-ton surge pile, belt conveyor to preparation plant housing secondary crushers and classifiers.

Rock garden for steel plants

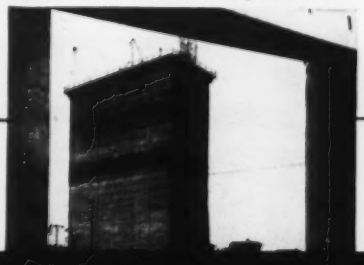
Steel plants live by the cultivation of this rock garden. For from this bed comes dolomite for Magnefer, Syndolag and other basic refractories used in the production of open hearth and electric furnace steel.

To keep pace with the expansion of the steel industry, we are enlarging our facilities for quarrying and preparation of ore, as well as for dead burning refractories. Happily, our reserves of this unusually pure dolomite at Maple Grove are sufficiently extensive to take care of the industry's needs for basic furnace refractories for an estimated 100 years.



One of the ore classifiers sizing dolomite for Magnefer. Wet screening removes all fines and undersized particles, thus insuring uniformity of grain size in the finished refractory.

Sized raw dolomite, ready for dead burning, is stored in huge silos at the feed ends of kilns. This new silo, 122-feet high, largest of its kind, will feed two new rotary kilns now being installed.



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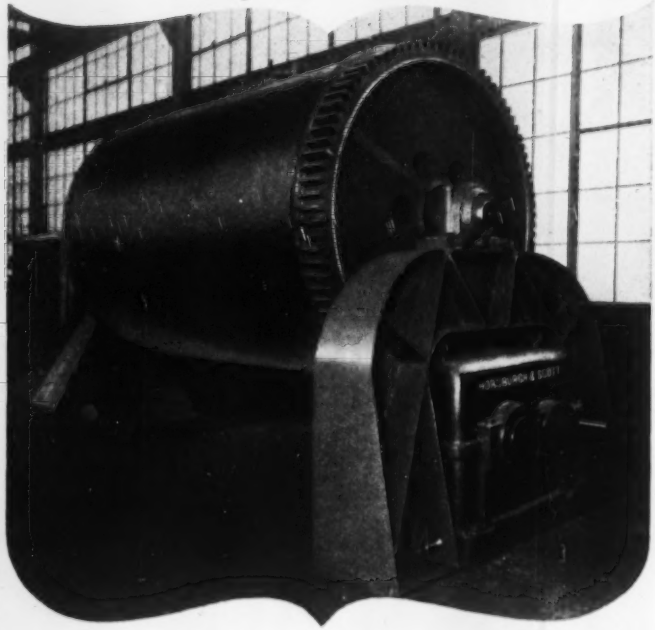

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Works to tolerances as close as .00025" on thickness, .0005" on width.

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LETTERS
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Will you kindly advise if the adhesive metal name plates described in STEEL (Nov. 19, p. 104) are available in England.

H. L. Evans
William Jessop & Sons Ltd.
Sheffield, England

• *We are forwarding your request for information to C & H Supply Co., Seattle, manufacturer of the name plates, who will be able to answer your question.*

We have received many other requests like the one above for information on the adhesive name plates described in the Nov. 19 article and a Production and Engineering News at a Glance item of Aug. 6. Some of those requests came from:

Gunder Rinden, purchasing agent
John Deere Spreader Works
East Moline, Ill.

G. E. Cole, president
Kleen-Stik Products Inc.
Chicago

J. Manuele, director
Headquarters Quality Control
Westinghouse Electric Corp.
Pittsburgh

P. M. Heinmiller, vice president
Utility Trailer Mfg. Co.
Los Angeles

C. M. Wolfenberger
Acme Steel Co.
Chicago

W. Hasty
Holland Furnace Co.
Holland, Mich.

D. Weltner
Cuyahoga Falls, O.

L. A. Johnsen
Research Corp.
Bound Brook, N. J.

Dale F. Harrah
Toledo Industrial Rubber Co.
Toledo, O.

G. V. Bakke
Marquette Mfg. Co. Inc.
Minneapolis

R. Edward Stein, vice president
Lewis Welding & Engineering Corp.
Bedford, O.

N. A. Husson, buyer
American Chain & Cable Co. Inc.
York, Pa.

Who and Where Department

Who manufactures the plastic pipe which will be installed on Navy mine sweepers mentioned in your article, "Copper Saver," (Mar. 10, p. 105)?

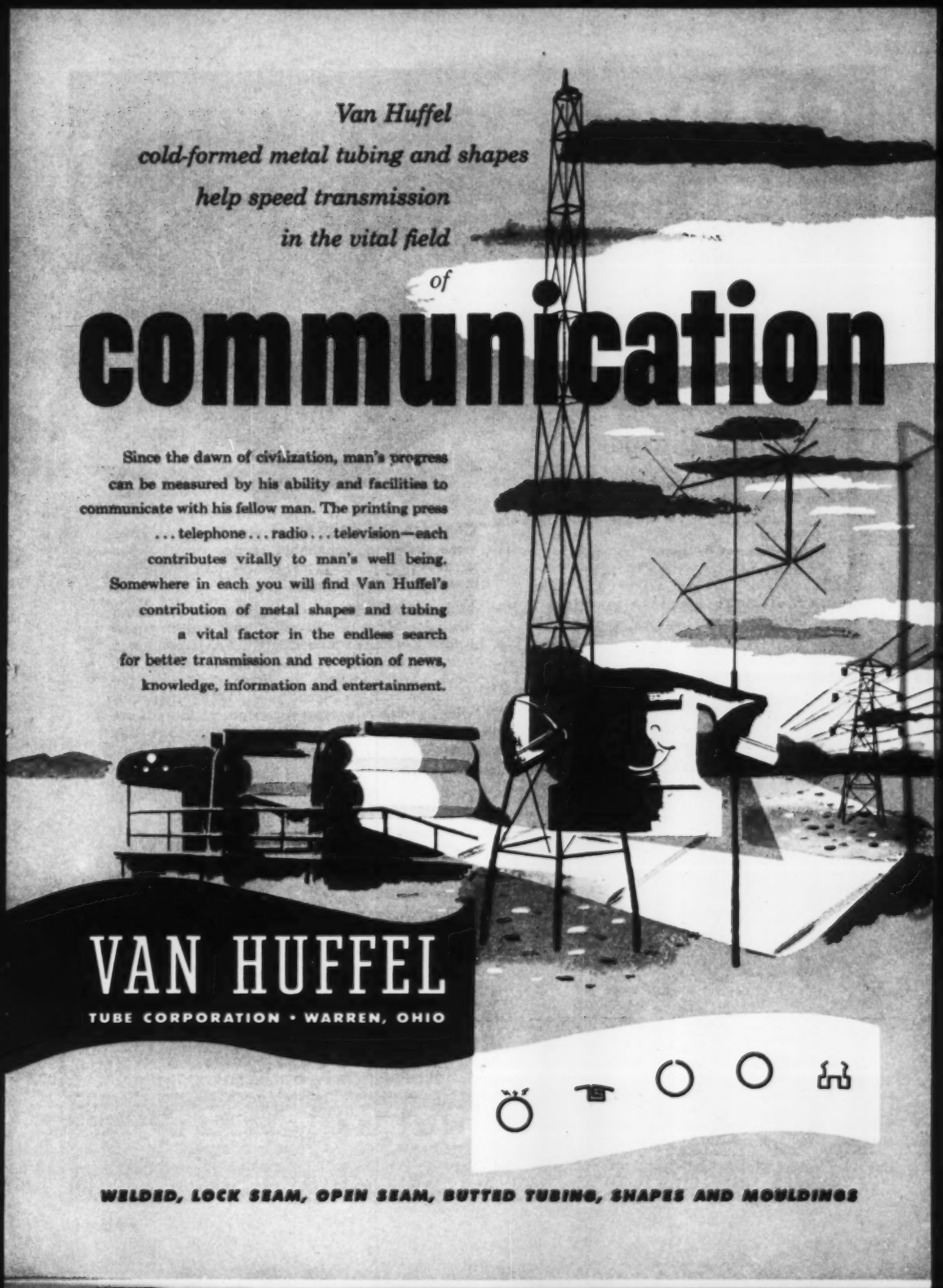
J. T. Fish
Ingersoll-Rand Co.
Phillipsburg, N. J.

• *Contact the Technical News Letter, Pentagon Building, Washington 25, D. C.*

We read with interest your article "Sounds in Clouds" (Feb. 18, p. 93). Where may we obtain further information on the Ionophone?

L. Rex Klopfenstein
Rowe Industries
Toledo, O.

• *Write to the Institute of Inventive Research, San Antonio, Tex.*


Van Huffel
cold-formed metal tubing and shapes
help speed transmission
in the vital field
of
communication
Since the dawn of civilization, man's progress can be measured by his ability and facilities to communicate with his fellow man. The printing press . . . telephone . . . radio . . . television—each contributes vitally to man's well being. Somewhere in each you will find Van Huffel's contribution of metal shapes and tubing a vital factor in the endless search for better transmission and reception of news, knowledge, information and entertainment.
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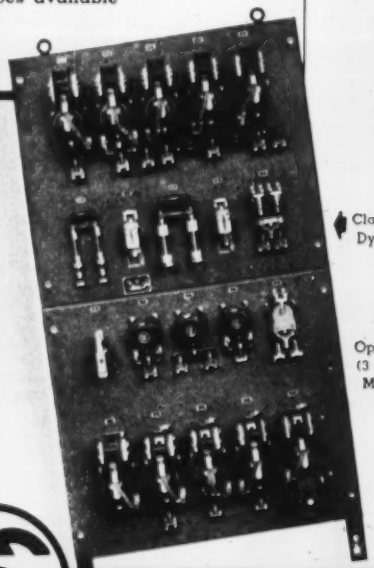
Bulletin 101, Type RD
Mill Master Switch

- Weatherproof enclosure is standard
- Dust-tight and water-tight enclosures available
- Sizes — 3 cams, 6 circuits
  6 cams, 12 circuits
  9 cams, 18 circuits
- Spring return available through a maximum of 14 circuits
- Mechanical latch at "off" point available
- Electrical interlock handle switches, and pedestal-mounted types available

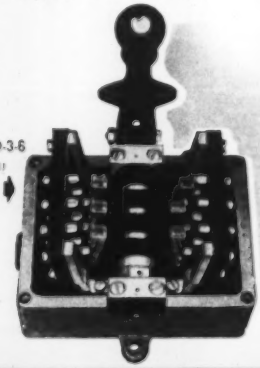
CLARK Bulletin 101-RD Master Switches have been delivering maximum service in all types of heavy-duty, rough-and-tumble mill and crane applications for 14 years.

Maintenance is kept to a minimum by mounting the main shaft needle roller bearings in brass blocks. Contact finger bearings are oil-impregnated and the cam roller is made of hardened drill rod. Double-break contacts are alloy silver, requiring no dressing. High-impact Bakelite operating cams with square holes, are mounted on the square shaft, and a large nut locks steel spacers and cams to maintain their lateral positions.

Consult our nearest District Office for complete information.



Clark Bulletin 9135
Dynamic Lowering
DC Crane Hoist
Controller



Open View, Type RD-3-6
(3 points — 6 circuits)
Mill Master Switch

THE CLARK CONTROLLER CO.

ENGINEERED ELECTRICAL CONTROL • 1142 EAST 152ND STREET, CLEVELAND 10, OHIO

VAPOR DEGREASING
meets aircraft industry's demand for
FAST, EFFICIENT METAL CLEANING

For peak efficiency in metal cleaning use DU PONT "TRICLENE" D

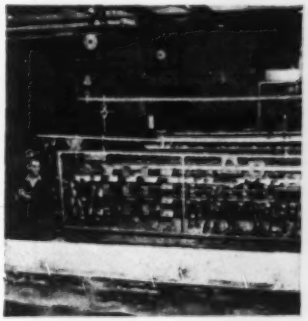
TRICHLORETHYLENE

"Triclene" D Trichlorethylene is the ideal solvent for vapor degreasing. Developed by Du Pont after years of research, it is non-flammable, stable and pure . . . stands up under moisture, air, heat and other destructive influences . . . and can be readily recovered for economical re-use. In short, "Triclene" D possesses *all* of the properties needed for the efficient and economical operation of a modern degreasing installation.

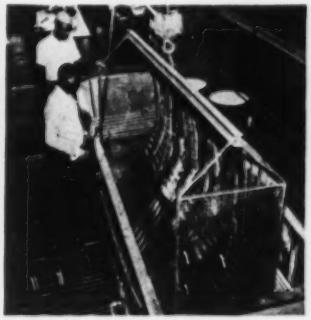
"Perclene" Perchlorethylene—another Du Pont solvent for vapor degreasing—is particularly suitable for operations requiring a high-boiling solvent. Like "Triclene" D, "Perclene" is a non-flammable, synthetic solvent of high purity.

DU PONT TECHNICAL SERVICE

A call to your Du Pont Solvent Distributor will bring prompt, practical advice from experienced technicians in the metal cleaning field. They'll be glad to tell you about "Triclene" D or "Perclene" and assist you on metal cleaning problems.



SMALL AIRCRAFT PARTS are vapor degreased prior to plating for thorough removal of cutting compounds. Compact vapor degreasing equipment is economical to use, simple to operate, easy to maintain.



ALUMINUM "SKIN" SECTIONS emerge thoroughly cleaned, instantly ready for the next process. Vapor degreasing cleans sections of any size or shape . . . saves time and cost in subsequent handling and finishing.

Speed and efficiency in metal cleaning are essential to production in modern aircraft plants. Vapor degreasing with Du Pont "Triclene" D Trichlorethylene meets these requirements . . . removes lubricants, quenching oils and protective grease from all types of aircraft tubing, machined parts and sheet metal sections. Parts come out thoroughly cleaned—usually in less than a minute!

Compact vapor degreasing equipment requires a minimum of valuable floor space in today's "stepped-up" production lines. Units handle a variety of different parts . . . can be adapted to manual or mechanized operation. The final cleaning step in each unit—passing the parts through pure "Triclene" D vapors—leaves each piece clean, warm and dry, ready for assembly or further processing. And cleaning costs remain low, since a large part of the contaminated solvent is recovered for economical re-use.

Perhaps vapor degreasing can mean increased efficiency in *your* metal cleaning program. The coupon below will bring you complete information.

Mail this coupon for facts on vapor degreasing

non-
DU PONT *flammable* SOLVENTS for VAPOR DEGREASING
SOLD NATIONALLY THROUGH DISTRIBUTORS

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150th Anniversary
BETTER THINGS FOR BETTER LIVING . . . THROUGH CHEMISTRY

E. I. du Pont de Nemours & Co. (Inc.)
Electrochemicals Dept., Wilmington 98, Delaware

Please send me detailed information on Vapor Degreasing: applications, advantages, equipment used, and Du Pont solvents available. We are interested in cleaning _____ products.

Name _____ *Position* _____

Firm _____

Street and No. _____

City _____ *State* _____

"Tycol Acylkup keeps bearings running cool... does not emulsify with water"

That's right! Tycol Acylkup Grease withstands heavy unit pressures . . . resists emulsification with water. It is easily applied by grease gun or central system.

Further, Tycol Acylkup Grease contains a high grade paraffin base cylinder oil that steps up bearing efficiency and assures increased bearing life. Protection against wear is long-lasting.

Your nearest Tide Water Associated Office will be glad to give you complete information. Call or wire today.

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TIDE WATER ASSOCIATED OIL COMPANY

17 BATTERY PLACE · NEW YORK 4, N. Y.

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Production Pointers from GISHOLT

TIME-SAVING IDEAS

Presented as a service to machine shops, we hope some of these interesting ideas, culled from thousands of jobs, will suggest ways to help you cut time and costs in your own metal work.

CROWDING 22 CUTS IN 2.5 MINUTES

Two Simplimatics Team Up for Rapid Production

Here's a rather intricate bevel drive gear blank that calls for 22 cutting tools to machine it. Normally, several operations would be needed to do the job.

Not this time. The job has been "*simpled*" down by the Simplimatic Automatic Lathe—with two machines handling all 22 machining operations. It's possible because the large platen table of this machine permits a flexibility of slide arrangements to bring more tools into work.

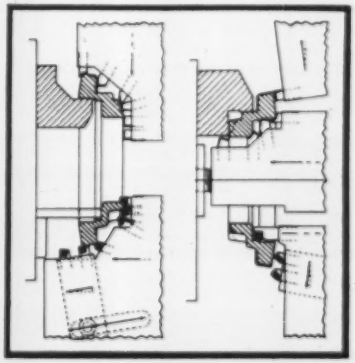
One operator tends both machines, with the 22 cutting operations split between the two so that a completed blank is turned out every 2.5 minutes.

A Machine for Each Side

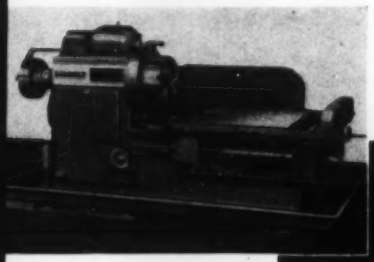
The first Simplimatic has a total of 14 tools arranged in the front and rear slides which do all exterior surfaces and the hub face. The part then moves to the second machine which has a total of 8 tools on three slides. The center slide handles the bore. The front slide roughs the taper face with a matched cut, while the rear slide finishes.

The almost limitless slide possibilities and large number of tool approaches of the Simplimatic allow this standard machine to do the job with all the benefits of a special machine.

The Simplimatic catalog pictures a wide range of interesting jobs. Ask for your copy.



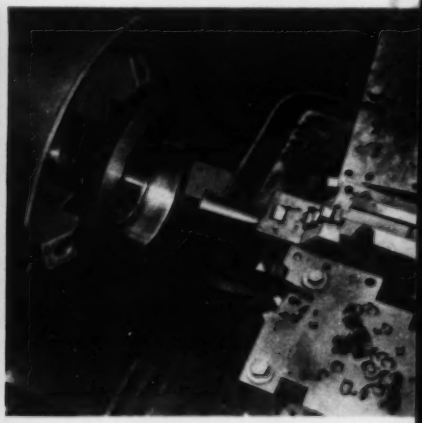
Tool setups for both Simplimatics.



Simplimatic Automatic Lathe.

● First operation in machining the bevel drive gear blanks has 14 tools working on front and rear slides.

● For the second operation, this Simplimatic has a center slide in addition to front and rear slides. Eight tools are used this time.



FOR MORE PRODUCTION FROM

GISHOLT

TIME-SAVING IDEAS

HOW TO MAKE EASY WORK OF DEEP GROOVING

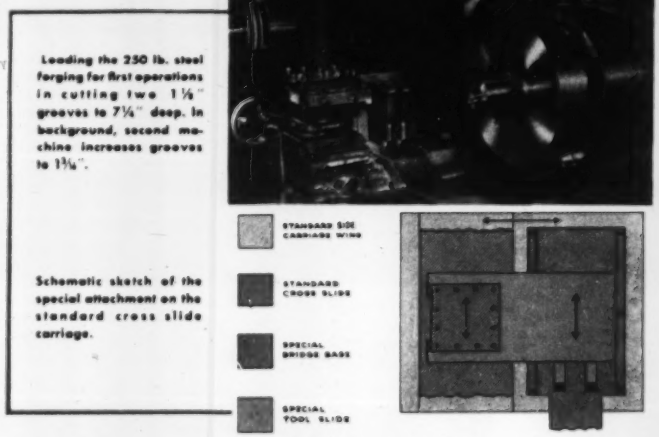
Special Attachment enables Standard Turret Lathe to do job

The large, heavy workpiece you see being handled here is a torsional vibration dampener for a diesel engine. The tricky part of the machining job is the cutting of two grooves around the 21" periphery—each 1 3/16" wide and 7 1/4" deep.

The work is divided into roughing and finishing operations on two 4L Saddle Type Turret Lathes, each having a special attachment on the standard cross slide carriage. This consists of a special bridge base bolted to the carriage wing at the front. This bridge also bears on the rear way and is held down and gibbed. On top of this fixed base is a tool slide block with extensions that clamp into the square turret. Thus, the forward motion of the cross slide and square turret carries the tool block and slide into the work.

The job starts with the first machine plunge cutting the two grooves to 1 1/8" width and full depth. Cuts are started at 17 r.p.m. and progressively increased to 31 r.p.m., with .006" feed used throughout. H.S.S. milling cutter blades, with a radius formed to curl the chips, are mounted in 1095 steel shanks.

Loading the 250 lb. steel forging for first operations in cutting two 1 1/8" grooves to 7 1/4" deep. In background, second machine increases grooves to 1 3/16".



Schematic sketch of the special attachment on the standard cross slide carriage.

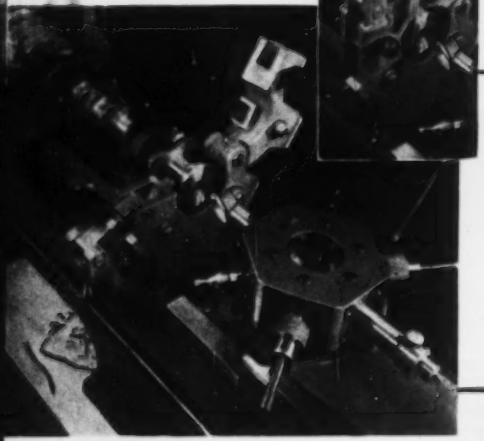
The part is then moved to the second machine where the grooves are increased to 1 3/16" width with the feed increased to .012". Finished width is held to .005", and the faces are held to .001" of perpendicular. The weight, size and material of the part—250 lbs. in 21 inches of steel forging—are good reasons for using the sturdy, powerful Gisholt 4L Turret Lathes on this job.

On this simple adaptation of Standard Turret Lathes, heavy workpieces are deep grooved with ease and accuracy.

LONG BED TURRET LATHE FINISHES CRANKSHAFT END

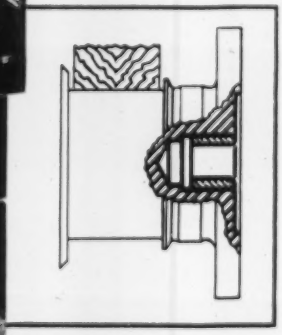
The opened steadyrest for locking crankshaft. All work is done on this end by the six turret stations.

Closed steadyrest.



All Work Handled from Hexagon Turret

This standard No. 3 Ram Type Turret Lathe has a special job—machining the flange end of a six-cylinder automobile crankshaft. To suit it for this singular job, there is a 24" longer bed and the front carriage has been omitted.



Cutaway drawing shows work on crankshaft end.

The crankshaft is driven from the gear end. The driving fixture (which has been balanced on a Gisholt Balancer) is a hinged half-bearing which drives against the crank cheek. The other end of the crankshaft has the main bearing supported by a steadyrest equipped with end-grain hardwood shoes.

Machining operations are relatively simple—drill, counterbore, finish bore and ream. After these, a .0005" undersize bushing is placed on the turret arbor and pressed into the counterbore. This permits the bushing to be reamed from the final turret station. Floor-to-floor time is 3.1 minutes. It's a good example of how a Standard Turret Lathe can be inexpensively adapted to handle an unusual part with speed and precision.

Simple bed extension enables this standard Ram Type Machine to perform 6 special finishing operations on crankshaft ends with all work handled from hexagon turret.

GISHOLT

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TIME-SAVING IDEAS

ONE MACHINE OUT-PRODUCES TWO

No. 12 Hydraulic Cuts Time 70%

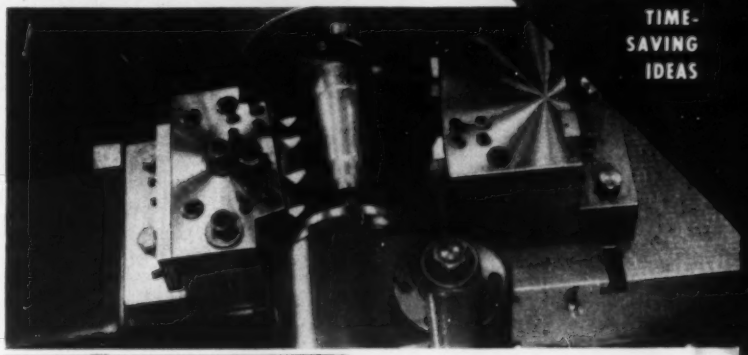
Here's a case where production of forged steel diesel injector bodies plodded along at 12 per hour with *two* lathes on the job.

Looking for a better way, this manufacturer found it—and did away with a second machine to boot. Now, the job is handled on one No. 12 Hydraulic Automatic Lathe at the rate of a completed part every 1.5 minutes—40 per hour.

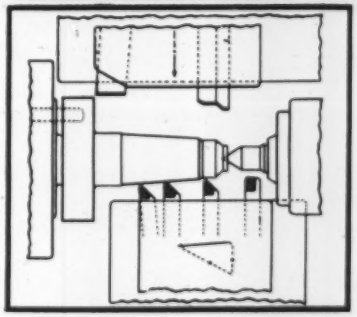
Four tools on the front carriage taper turn the entire length of the body. Two tools on the rear slide move in to face the shoulder and then drop into reduced feed to shave form the straight diameters. Tooling is well planned, permitting two other bodies of similar style to be handled with a minimum of changeover.

Because of the No. 12 Hydraulic's automatic cycle, the operator is able to handle another machine as well for even more production.

In a single automatic operation, this one No. 12 Hydraulic finishes parts in 1.5 minutes, which two machines needed 5 minutes to do.



Closeup of No. 12 Hydraulic Automatic Lathe tooled for machining injector body.



Tooling setup of front and rear slides of No. 12 Hydraulic.

New literature, showing 28 widely different jobs being done by this versatile machine, is now ready.

HOW TO MAKE BIG SAVINGS ON GEAR BLANKS

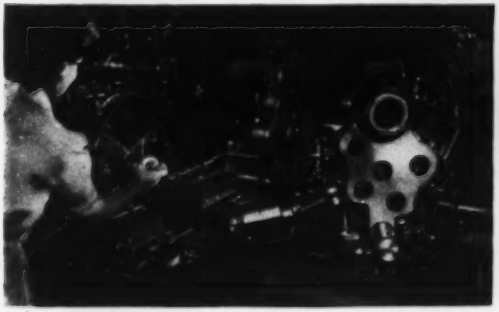
Four Times Faster Production on Fastermatic Automatic Turret Lathe

You don't need long runs to profit from the economies of the Fastermatic Automatic Turret Lathe. Here's a case where the Fastermatic with simple, standard turret lathe tools produces gear blanks in lots of 100 with real savings.

The operations are rough and finish turning, facing and boring. Where it required 8 minutes to do the job by the older method, floor-to-floor time is now a flat 2 minutes—a 400% production boost! Moreover, because the entire cycle is automatic, the job was turned over to a woman—making skilled man power go further. Not only are critical tolerances maintained, because of the reduction of the human element of a hand-operated machine, but operator also runs a 2nd machine.

Write for copies of the Fastermatic Catalog and Fastermatic Tool Catalog, showing the many standard tools available for production work.

The Fastermatic with standard turret lathe tools, operated by a woman, proves the savings in time and skilled man power this machine makes possible—even in medium runs.



Fastermatic setup for machining 25 gear blanks per hour.

Rough casting and finished gear blank 2 minutes after.

GISHOLT

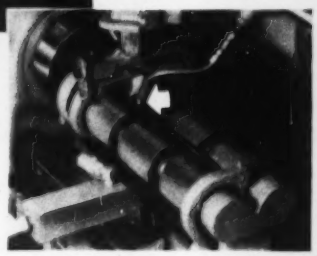
TIME-SAVING IDEAS

ONE MACHINE SUPERFINISHES THREE SHAFTS AT ONCE

Three-Station Superfinisher Does Large Volume Job

Special 3-station Superfinisher for handling three different parts at once.

Close-up of one station of the Superfinisher. Arrow points to Superfinish stone which makes 4 passes over stock rotated between the two Phenolic rolls.



Here is the way shafts of various lengths and diameters are Superfinished at once on one machine. This Superfinisher, a special model, has three stations, each handling a different size. Station 1 handles ¼" stock up to 9" long; station 2 takes ½" stock up to 16" long, and station 3 accommodates ⅝" stock up to 17".

Stock is loaded into each station and buttons pressed to start operations. Phenolic rolls then rotate the work while the head with two Superfinish stones comes into working position. The oscillating head makes four passes over the stock at the rate of 7½" per minute. After the fourth pass the head rises, an ejector raises the finished workpiece, and rolls it into a tote pan. The station then gets a new workpiece. All stations operate identically. Stock measures 15-20 micro inches RMS as it comes to the machine, and 3-4 micro inches RMS after Superfinishing.

One operator tends this 3-station Superfinisher to produce exceptionally smooth shafts.

Ask for book "Wear and Surface Finish," which gives complete, up-to-the-minute information.

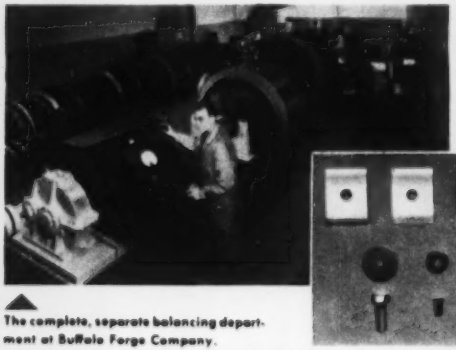
HERE'S A REAL BALANCING DEPARTMENT

Wide Variety of Work Handled on Efficient Production Basis

The importance of balancing is given full recognition at the Buffalo Forge Company. This leading manufacturer of fan rotors uses balancing to eliminate vibration, premature bearing wear and undue noise in these rotating parts.

Theirs is a true *production* setup, with all balancing done in a complete, separate department as a regular part of manufacturing operations. A variety of Gisholt Balancing Machines do static and dynamic balancing of parts weighing from two pounds to two tons. Both balancing and correction of unbalance are done on the same machines.

So fully systemized is this operation, even unbalance corrections are *pre-planned*. This is possible because the readings of unbalance can be set to whatever unit of correction is most convenient. In this case, it's in grams. The operators take direct readings from the balancers and then gather studs or rivets and washers, each having a given weight, for the needed combination to make indicated correction on any workpiece.



These parts can be used in any combination to provide the exact weight in grams for correcting unbalance in all size rotors.

The complete, separate balancing department at Buffalo Forge Company.

Gisholt Balancing Machines greatly simplify production balancing by enabling the user to read the measurements in the exact correction units most convenient for the work.

DYNETRIC BALANCERS

Production balancing like this is only one of many helpful subjects offered in the complete program of the Gisholt Balancing School. Write for full details and starting dates.

THE GISHOLT ROUND TABLE represents the collective experience of specialists in the machining, surface-finishing and balancing of round and partly round parts. Your problems are welcomed here.

432
No. 581

GISHOLT MACHINE COMPANY
Madison 10, Wisconsin

Write for your copy of Gisholt's new general catalog.

TURRET LATHES • AUTOMATIC LATHES • SUPERFINISHERS • BALANCERS • SPECIAL MACHINES

ALLOY STEEL UNNECESSARY!

COSTS CUT IN HALF
Excellent
WEAR RESISTANCE
Obtained...
with GROUND and POLISHED
STRESSPROOF
STEEL BARS
In this Kearney & Trecker new Model CK vertical milling machine, the 2" diameter feed screw (right) is made from Ground and Polished STRESSPROOF

THREE OPERATIONS ELIMINATED

- QUENCHING
- TEMPERING
- STRAIGHTENING

Ground and Polished STRESSPROOF has been used for lead and feed screws by Kearney & Trecker since 1939. If STRESSPROOF were not available, they would need a .50% carbon-alloy steel to obtain the required strength and wear-resistant properties. The substitution of alloy would require quenching, tempering, and straightening—operations not necessary with Ground and Polished STRESSPROOF. The cost of the part would be more than doubled.

For precision work, lead and feed screws for machine tools must maintain their accuracy through years of operation. Ground and Polished STRESSPROOF cuts cost for these exacting parts because it provides *five* qualities in the bar—(1) *high strength*, double that of ordinary cold-finished shafting; (2) *machinability*, fully 50% better than heat-treated alloys of the same hardness; (3) *high resistance to wear*, replacing many heat-treated or carburized alloys; (4) *minimum warpage*, obtained by special processing; and (5) *accurate, finely ground surface*.

It is significant that the only suitable substitute for STRESSPROOF is an alloy steel requiring many additional expensive production operations.

STRESSPROOF
IS PLAYING A VITAL ROLE
IN NATIONAL DEFENSE!
A very large proportion of STRESSPROOF production, today, is going into defense jobs. However, sample bars are available for testing purposes.

La Salle STEEL CO.

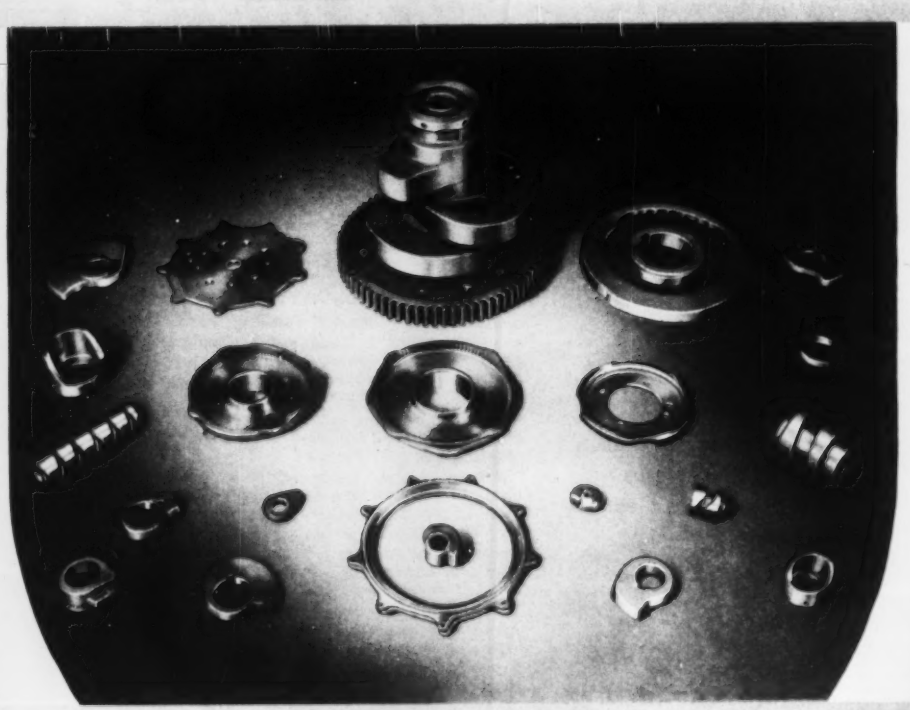
1414 150th Street, Hammond, Indiana

Manufacturers of the Most Complete Line of Cold-Finished and Ground and Polished Bars in America

KUX

EXPERTS AT CAM CUTTING and GRINDING

THE LARGEST, most completely equipped plant in the country devoted to CAM cutting and grinding is at your service. 25 YEARS of experience in making special cams for thousands of companies have made us experts at cam cutting and grinding. Our facilities and equipment, finest in the country, permit us to manufacture any style or size Cam, Geneva Motion or Scroll Plate in quantities of 1, 10 or 10,000. Accuracy can be maintained to split thousandths, and surfaces to micro-finishes. Send us specifications or blueprints and we will be glad to submit a detailed quotation on your requirements.



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Think of tool steel — think of Crucible! That's the reputation we've had for over half a century with our tool steel users. We've never stopped working to maintain our leadership . . . leadership that has kept us the country's *number one* tool steel producer.

Crucible research and development continues to match Industry's need for new and improved tool steels. You can profit from the experience gained by Crucible in the application of tool steels to thousands of uses. Our metallurgical service is freely available to you . . . and our conveniently located warehouses maintain a full supply of tool steels for prompt delivery.

SEND TODAY for the unique Crucible Tool Steel Selector — a twist of the dial gives the tool steel for your application.

Rex® High Speed Steels
Peerless Hot Work Steels
Halcomb 218
Chro-Mow®
Sanderson Carbon Tool Steels
Kotos®
Airkool Die Steel
Airdi® 150
Nu-Die V Die Casting Steel
CSM 2 Mold Steel
La Belle® Silicon #2
Atha Pneu

SPECIFY YOUR TOOL STEELS BY THESE BRAND NAMES

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Dept. S, Chrysler Building, New York 17, N. Y.

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Company_____ Title_____

Address_____ City_____ State_____

9" diameter, 3-colors

CRUCIBLE first name in special purpose steels

52 years of Fine steelmaking

TOOL STEELS

CRUCIBLE STEEL COMPANY OF AMERICA · TOOL STEEL SALES · SYRACUSE, N. Y.

SHIELD *of* MODERN FIRE PROTECTION

"headquarters for the finest"!

Foremost design, experienced engineering, quality materials, expert workmanship and operating superiority are all bywords of the C-O-Two Fire Equipment Company . . . originators of the world famous C-O-TWO Squeez-Grip Carbon Dioxide Type Fire Extinguishers.

C-O-TWO, being specialists in modern fire detecting and extinguishing equipment for many years, are constantly striving to develop new and improved types of fire protection equipment that will render highly efficient results in safe-guarding life and property from the ravages of fire.

With C-O-TWO Fire Protection Equipment, simplicity, practicability, longevity and minimum maintenance are built-in features that guarantee fast, positive action the instant fire strikes. Furthermore, extensive skill and high quality standards, together with approvals such as the Underwriters' Laboratories, Inc., Factory Mutual Laboratories, Armed Forces and Government Bureaus assure you of the finest in modern fire protection equipment.

Among the many types of up-to-date fire protection equipment manufactured by C-O-TWO, the following comprise the principal items on the market today:

- **carbon dioxide type hand and wheeled portable fire extinguishers**
- **dry chemical type hand and wheeled portable fire extinguishers**
- **carbon dioxide type hose rack and hose reel fire extinguishing units**
- **built-in high pressure carbon dioxide type fire extinguishing systems**
- **built-in low pressure carbon dioxide type fire extinguishing systems**
- **built-in smoke fire detecting systems**
- **built-in heat fire detecting systems**
- **high pressure carbon dioxide cylinder recharging equipment**

So, with current expensive delayed replacements, why not let an expert C-O-TWO Fire Protection Engineer help you now in planning modern, economical, fully approved fire protection facilities for your various properties. Our experience is at your disposal . . . no obligation of course. Get the facts today!

C-O-TWO FIRE EQUIPMENT COMPANY

NEWARK 1 • NEW JERSEY

Sales and Service in the Principal Cities of United States and Canada

Affiliated with Pyrene Manufacturing Company

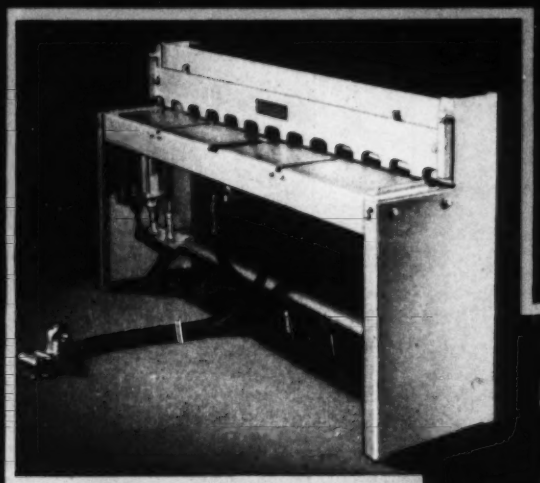
MANUFACTURERS OF APPROVED FIRE PROTECTION EQUIPMENT

Squeez-Grip Carbon Dioxide Type Fire Extinguishers • Dry Chemical Type Fire Extinguishers • Built-In Smoke and Heat Fire Detecting Systems
Built-In High Pressure and Low Pressure Carbon Dioxide Type Fire Extinguishing Systems

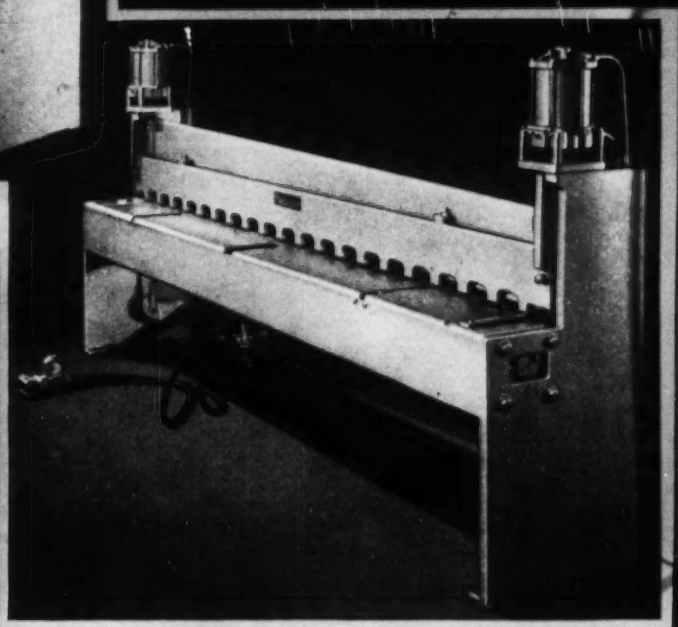
Announcing NIAGARA

AIR POWER SQUARING SHEARS

for the Thrifty Sheet Metal Shop



Capacity 16 Gage—3 ft., 4 ft. and 6 ft. Cutting Lengths.



Patented and Patents Pending

Capacity 18 Gage—8 ft. and 10 ft. Cutting Lengths.

FEATURES

- Low Initial Cost . . . Simplified Construction
- Cutting lengths ranging from 3 to 10 feet
- Capacity 16 and 18 gage mild steel
- Economical Operation
- Operates from average shop air line or a small compressor
- Flexible hose to foot treadle permits operator to trip shear from any convenient location
- One man effortless operation
- Accurate Cuts
- Unbreakable all steel construction
- Adjustable laminated plastic ways
- Automatic holddown
- Micrometer and quick acting back gages

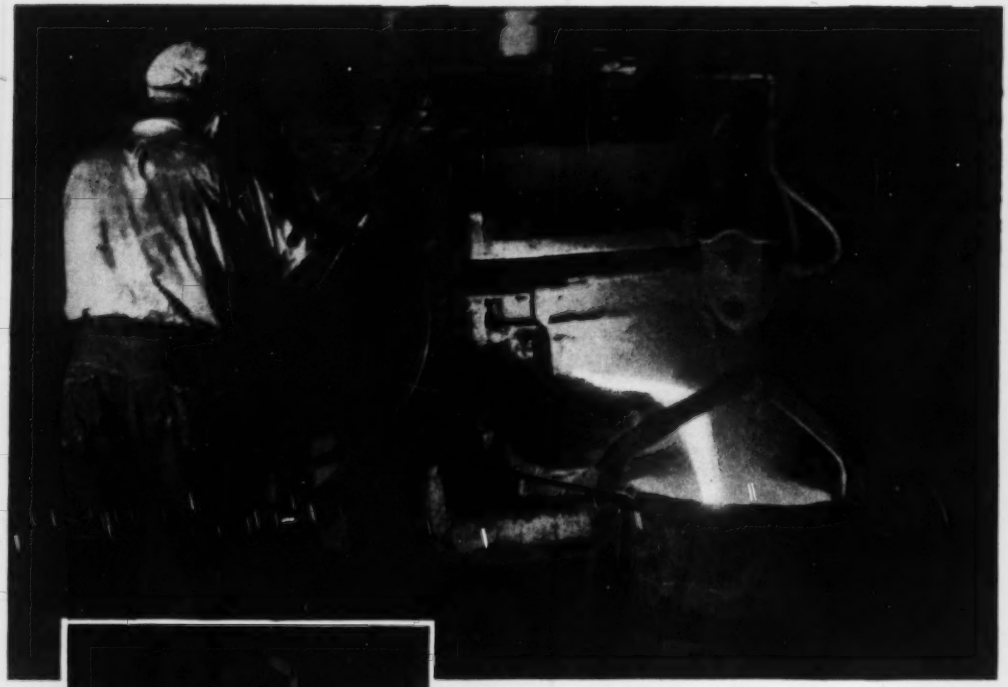
WRITE FOR NEW BULLETIN 87

NIAGARA MACHINE AND TOOL WORKS, BUFFALO 11, N. Y.

America's Most Complete Line of Presses, Shears, Machines and Tools for Sheet Metal Work

DISTRICT OFFICES: NEW YORK, CLEVELAND, DETROIT, PHILADELPHIA

Dealers in principal U. S. cities and major foreign countries



Strong, sound irons for special castings are produced in this Lectromelt Furnace at Ferro Machine & Foundry Company, Cleveland.

Lectromelt Furnaces grow BIG, too.

Nicknamed "The Drugstore" because it fills prescriptions so accurately...

"With our electric-furnace duplexing process, we are able to produce special irons for a great variety of castings requiring heat and wear resistance and ability to withstand extreme pressure . . . and do it economically."

In the duplexing process at Ferro Machine & Foundry Company, molten iron from the cupola is poured into the Lectromelt Furnace. There, elements are added or removed to give the exact composition specified and the charge is superheated electrically to achieve a fine-grain structure. Thus, special irons are produced as regular routine.

Lectromelt Furnaces range in capacities from 24 pounds to 150 tons, meeting every development and production requirement. They're on melting, refining, smelting and reduction work. For Bulletin No. 7, telling you more about them, write Pittsburgh Lectromelt Furnace Corporation, 323 32nd St., Pittsburgh 30, Pa.

Manufactured in . . . CANADA: Lectromelt Furnaces of Canada, Ltd., Toronto 2 . . . ENGLAND: Birlec, Ltd., Birmingham . . . SWEDEN: Birlec, Elektkraugnar A. B, Stockholm . . . AUSTRALIA: Birlec, Ltd., Sydney . . . FRANCE: Stein et Roubaix, Paris . . . BELGIUM: S. A. Belge Stein et Roubaix, Brasseux-Liege . . . SPAIN: General Electrica Espanola, Bilbao . . . ITALY: Forni Stein, Genoa.

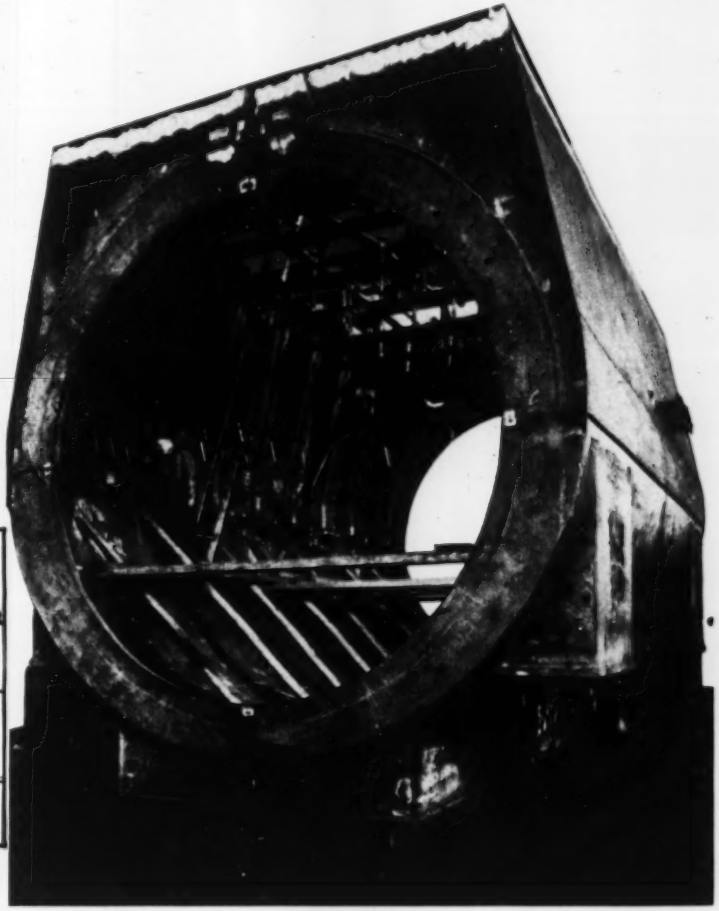
WHEN YOU MELT... MOORE RAPID *Lectromelt*

BUILDING A GREATER AMERICA

Lilliput

...ON THE DELAWARE

There's a lot of work on the shell and steam inlet of a Condenser of more than 60,000 square feet . . . and a lot of ability in the men at Sun Ship who handle such jobs.



Even the huskiest worker at Sun Ship looks like one of Gulliver's tiny Lilliputians when he is working inside a giant condenser . . . or around any of the mammoth pieces of special equipment produced by the metal-magic of the big shipyard on the Delaware.

But the picture changes when you measure the men . . . or the plant . . . by the job it has been doing for American industries since 1916.

Ships . . . of course. But shipbuilding is only part of the picture at Sun Ship. Its four steel-fabricating shops comprise more than a quarter million square feet of floor space with layout, fabricating, welding and assembling sections. As the many industries it serves well know, its facilities for building special machinery and for fabricating equipment of every kind make it a mighty and versatile figure in American industry, even apart from its marine work.

On land as on sea, Sun Ship and its thousands of skilled workers play a vigorous part in building a greater America.

Sun

SHIPBUILDING & DRY DOCK COMPANY

SINCE 1916

ON THE DELAWARE • CHESTER, PA.

25 BROADWAY • NEW YORK CITY

GAS
THE MODERN FUEL FOR ALL INDUSTRY

process . . . *Calcining* and *Sintering* in continuous *GAS Kilns* at RCA Victor Division

product . . . Non-conducting, magnetic, compacted cores, sintered after initial calcining

The RCA Victor Division of RADIO CORPORATION of AMERICA, in Camden, New Jersey, utilizes the productive flames of GAS in calcining and sintering operations.

Loading the Gas-fired continuous kiln, built by Selas Corporation of America, at Camden, New Jersey plant of RCA Victor Division.

Continuous Gas-fired kilns, installed in 1949, provide the exact temperatures RCA Victor requires for calcining and sintering these cores. Careful control of temperatures and products of combustion are essential to these processes, but the ease of such control afforded by GAS and Modern Gas-fired Industrial Equipment is only one reason for the extensive use of GAS by Industry. Here are some others:

- Modern Gas-fired Industrial Equipment fits readily into production lines
- GAS affords precise temperature control
- GAS is versatile. Gas performs virtually every heat processing operation regardless of temperature range

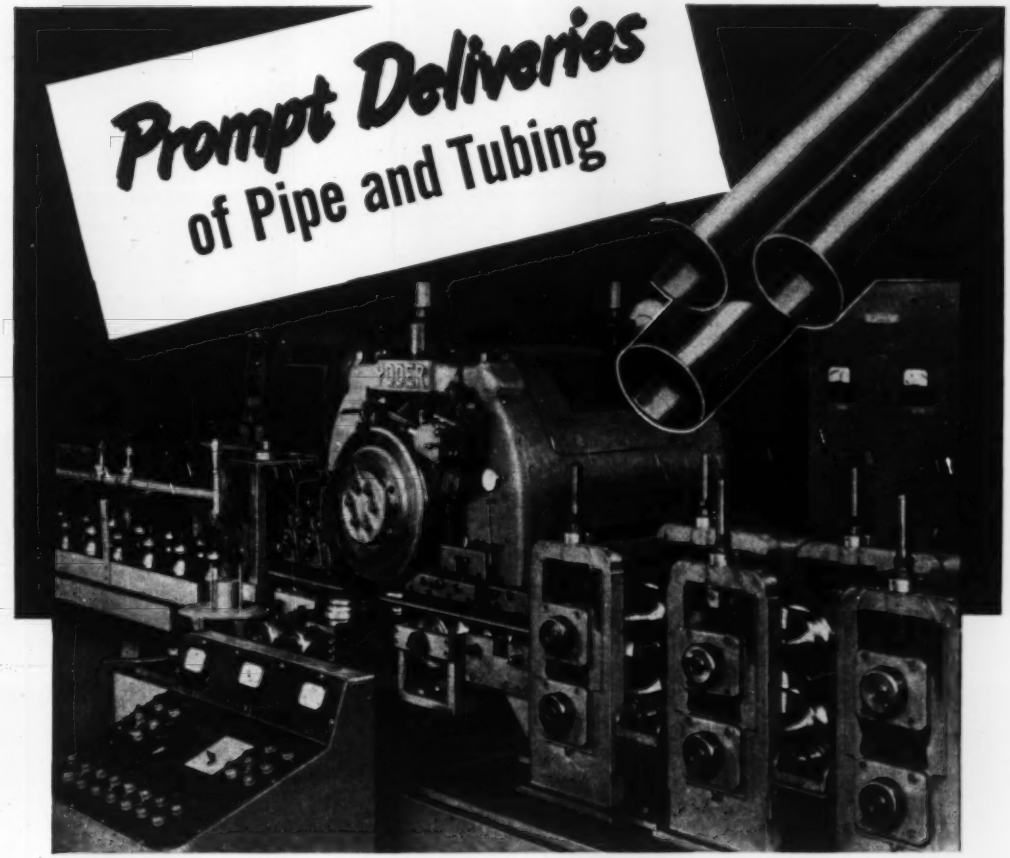
Controls on Gas-fired Industrial furnaces and equipment are positive, affording precise temperature determination and control throughout production line cycles.

Get the facts on GAS for All Industry from your Gas Company Representative. Call him today.

See the A.G.A. Combined Exhibit at the Annual Convention of the American Foundrymen's Association at Atlantic City, May 1-7.

AMERICAN GAS ASSOCIATION, 420 LEXINGTON AVENUE, NEW YORK 17, N. Y.

Prompt Deliveries of Pipe and Tubing



may be realized by installing a low-cost Yoder Cold-Roll-Forming, Electric-Weld Tube Mill. Cold or hot rolled strip is fed continuously into the mill, coming out as finished pipe or tubing, automatically cut to length.

Yoder mills are notable for their low first cost, high speed, low labor and maintenance cost. They offer not only the highest production per dollar of investment, but for most requirements also the lowest conversion cost per ton, in making sizes from ¼″ up to 30″ diameter.

Through recent exclusive Yoder developments, higher production is now obtainable than ever before. For sizes up to 3″ dia., speeds up to 250 fpm are obtainable with a Yoder-Tocco induction welder incorporated in a Yoder mill.

For making the largest sizes, when tonnage requirements are not too high, the initial investment may be greatly reduced with a Yoder Press-forming, Arc-weld mill.

Yoder offers you the widest choice of mills of proven performance. Over 150 Yoder Pipe and Tube Mills are now in successful operation all over the world. Literature and further information on request.

THE YODER COMPANY • 5502 Walworth Ave., Cleveland 2, Ohio

Complete Production Lines

- ★ **COLD-ROLL-FORMING and auxiliary machinery**
- ★ **GANG SLITTING LINES for Coils and Sheets**
- ★ **PIPE and TUBE MILLS—cold forming and welding**

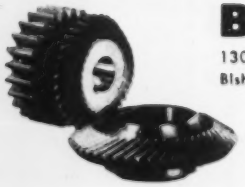
ENGINEERING YODER MANUFACTURING

above • Looking down inside
you see gears ready for shot-peening
and spiral conveyor
which returns used shot

right • Front view with lid raised
showing other gears
to be shot-peened

Shot-Peening is a method of toughening gears to make them wear longer. BRAD FOOTE'S shot-peening machine, one of the largest ever made, bombards the gear with shot under pressure. As each shot strikes it compacts the metal and hardens a minute area of the gear's surface.

• Shot-peening is another service which BRAD FOOTE has available for improving the quality of gears you buy for use in your own shop... or on the equipment you make for others. It is another step in our complete gear manufacturing process which means that *"no one shares our responsibility."*



BRAD FOOTE GEAR WORKS, INC.

1309 South Cicero Avenue • Cicero 50, Illinois
BIshop 2-1070 • OLympic 2-7700

subsidiaries

AMERICAN GEAR & MFG. CO.
Phone: Lemont 920
Lemont, Illinois

PITTSBURGH GEAR COMPANY
Phone: ATlantic 1-9950
Pittsburgh 22, Pennsylvania

a few words about alloy steels

or... THE ALTERNATE ALLOY that never interrupted production

This could happen to you! A customer of ours was forced by restrictions and alloy shortages to switch from the Republic alloy steel he'd been using for years to one of the alternate alloys that he could get. He'd dreaded the problems of redesigning tools and dies, of revising heat-treating procedures, of heavy reject rates while the switch was being made.

But these troubles never came!

He called upon the Republic 3-Dimension Metallurgical Service . . . the Republic Field Metallurgist, backed up by the Republic Mill and Laboratory Metallurgists. These three men worked with the customer's metallurgist and his production foreman. Together, they analyzed his requirements, recommended the best available alternate steel, worked out the way to form the steel and heat-treat it.

The shift was made with almost no interruption, and never a headache.

We may be able to do the same job for you . . . and to back up our recommendation with one of the many fine alloys produced by Republic . . . world's largest producer of alloy and stainless steels.

REPUBLIC STEEL CORPORATION
Alloy Steel Division • Massillon, Ohio
GENERAL OFFICES • CLEVELAND 1, OHIO
Export Department: Chrysler Building, New York 17, N. Y.

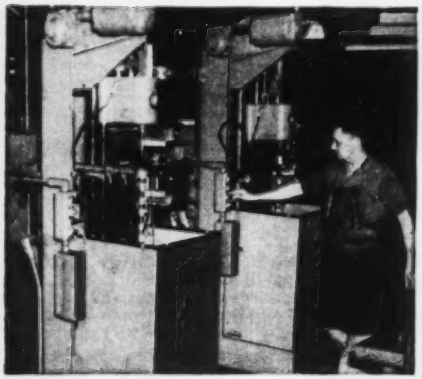
REPUBLIC STEEL

ALLOY STEELS

Other Republic Products include Carbon and Stainless Steels—Sheets, Strip, Plates, Pipe, Bars, Wire, Pig Iron, Bolts and Nuts, Tubing

WHICH OF THESE HEAT-TREATING PROBLEMS IS YOURS?

Westinghouse **RF** heating helped Saco-Lowell solve all six



Saco-Lowell Shops, makers of outstanding textile machinery, had always experienced problems with hardened bottom front rolls.

A Westinghouse 50 KW-450 KC RF Generator, with two standard vertical scanners, helped increase line production rates by 145% with total annual savings of $18,300.00. Direct labor costs have been cut 63%. Journal bearings are now ground after hardening, producing a higher quality roll. Formerly, every shaft required straightening; now this operation has been simplified and costs are reduced 70%.

Look at the results obtained by Saco-Lowell with a Westinghouse process that can handle 432 different rolls. Examine your heat treating problems. They, too, may be reduced, clarified, or eliminated entirely.

J-02243

Westinghouse Electric Corporation
Department S-43
2519 Wilkens Avenue • Baltimore 3, Maryland

Send me your informative case history booklet on induction heating.

Name .....

Company .....

Street .....

City ..... Zone ..... State .....

INDUCTION HEATING

P&H OVERHEAD CRANES

Hold us COMPLETELY RESPONSIBLE!

P&H is the only crane builder producing complete electrical equipment for overhead cranes. P&H electric motors are designed specifically for crane service — for frequent reversal, with ample safety factor. P&H crane controls are designed for a single purpose — to insure the perfectly coordinated performance to meet your job requirements — and keep it that way! When you specify P&H crane electrical equipment, you can look to this one dependable source for complete service. There are no delays — no buck-passing. P&H — America's leading crane builder — welcomes this complete responsibility!

P&H Magnetorque* AC control is the greatest crane improvement in 20 years. Ask about it!

*T.M. of Harnischfeger Corporation for electro-magnetic type brake.

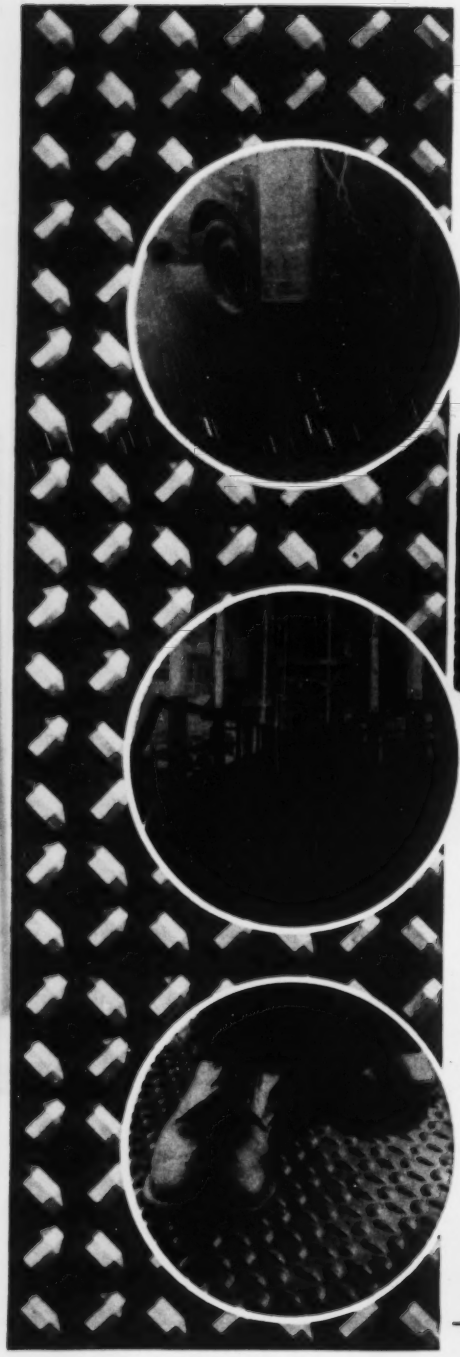
P&H OVERHEAD CRANE DIVISION

HARNISCHFEGER CORPORATION

4411 WEST NATIONAL AVENUE • MILWAUKEE 14, WIS.

Over 17,000 P&H cranes serve American Industry — far more than any other.

POWER SHOVELS • CRAWLER AND TRUCK CRANES • OVERHEAD CRANES • HOISTS • ARC WELDERS AND ELECTRODES • SOIL STABILIZERS • DIESEL ENGINES • PRE-FABRICATED HOMES

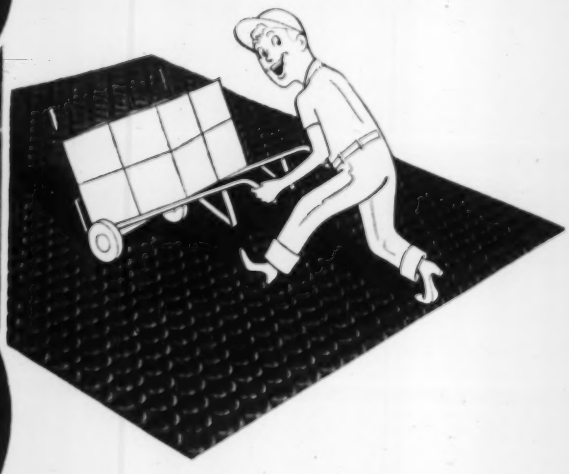


"Where wheels must roll, use Multigrip
To give them better traction . . .

To make your floors and ramps skidproof,
Keep maintenance to a fraction.

And Multigrip is rugged too,
It will not crack or chip.

So guard your floors the permanent way,
With non-skid Multigrip!"



SURE FOOTING FOR YOUR WORKERS. U·S·S Multigrip Floor Plate provides safe, sure footing for your workers, positive traction for vehicles. The risers are so spaced that several of them grip the foot at all times. They have flat tops and sloping sides . . . there is nothing to catch the toe of a shoe, no gutters to trap a narrow wheel. Tires roll *on* the risers, not *between* them.

There are many uses for Multigrip—from small step plates on machinery to coverings for entire factory floors. Get further information about Multigrip from your nearest steel warehouse or write to us direct.

UNITED STATES STEEL COMPANY, PITTSBURGH
COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO
TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA.
UNITED STATES STEEL SUPPLY DIVISION, CHICAGO
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

U·S·S multigrip

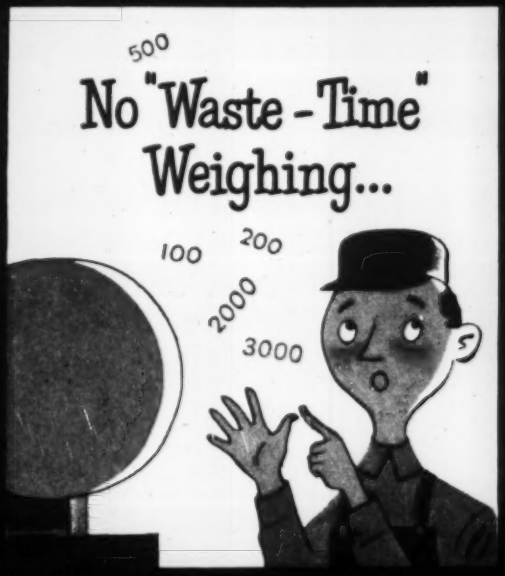
FLOOR PLATE

USS

Sold by leading distributors from coast to coast

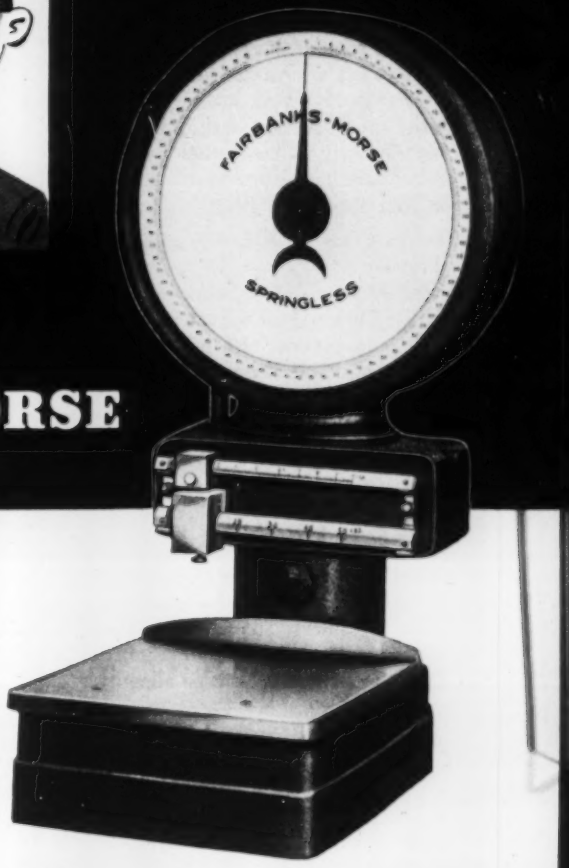
2-194

UNITED STATES STEEL



WITH

FAIRBANKS-MORSE



You speed your weighing operations with Fairbanks-Morse Bench Dial Scales. And that means there are no "bottlenecks" to hold up production all through your plant. Here's why:

With Fairbanks-Morse Bench Dial Scales, weights are read right at the point of the indicator. No time-wasting mental calculations are needed. You can weigh as fast as material can be moved on and off the scale platform. And, easy-to-read charts plus elimination of mental calculations reduce the possibility of human error . . . stop profit-eating weighing losses.

To eliminate "waste time" weighing in your operations, consult your Fairbanks-Morse weighing expert. Or, if you prefer, write Fairbanks, Morse & Co., 600 S. Michigan Ave., Chicago 5, Ill.

FAIRBANKS-MORSE,

a name worth remembering

SCALES • DIESEL LOCOMOTIVES AND ENGINES • ELECTRICAL MACHINERY • PUMPS
HOME WATER SERVICE EQUIPMENT • RAIL CARS • FARM MACHINERY • MAGNETOS

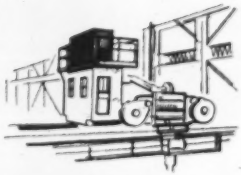
only at **DRAVO** can you get . . .

a **COMPLETE LINE** of

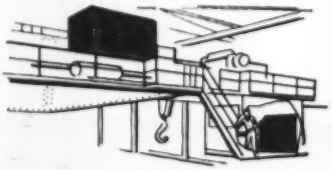
CRANE CAB COOLERS AND CONDITIONERS

No matter what radical temperature variations or atmospheric conditions occur in your industry, there's a Dravo Crane Cab Cooler or Conditioner available to protect your crane cab operator, safeguard his health, increase his efficiency and alertness and improve safety and production records in your operations.

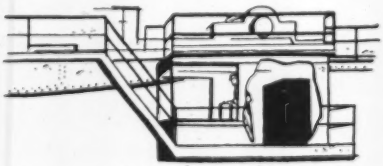
Dravo Crane Cab Coolers and Conditioners provide complete air conditioning, filter the air, remove dusts, dirt and fumes; heat the cab in winter, cool it in summer and provide constant ventilation the year around.



SELF-CONTAINED COOLERS—mounted alongside the cab or on the cab roof. Only electrical leads and connections required. Thermostat control—fully automatic—maintains 85° F. temperature with ambient temperatures up to 175° F. Ideal for "hot spots" in steel and other metal-working industries.



SPLIT-TYPE COOLERS—installed on the crane in two sections—the heavy condenser unit *on the crane* wherever you want it—the light cooling section *in the cab* with the operator. Two sections joined only with refrigerant pipe and electrical connections.



SMALL HEATERS AND VENTILATORS—especially designed to filter dusts and dirt, remove fumes, provide constant ventilation, supply heat in winter. Ideal for cranes in quarrying, slag, cement and similar industries.

One Source of Supply—Easy Installation

Dravo is your *one source of supply* for all crane cab coolers and conditioners. Units are quickly and easily installed with a minimum of downtime required. Parts are interchangeable on all units.

Available for Immediate Delivery

No delays in getting the units you want. For more information write for a complete catalog—or phone your nearest Dravo sales office and have our representative call on you.

DRAVO

DRAVO

CORPORATION

606 Dravo Building, Fifth and Liberty Avenues, Pittsburgh 22, Pa.

ATLANTA • BOSTON • CHICAGO • CLEVELAND • DETROIT • NEW YORK • PHILADELPHIA • PITTSBURGH

What's in Vermont this month?

NOW, INTERCHANGEABLE GLASS PARTS THROUGH INTERNAL GRINDING. A standard machine tool designed for metalworking was recently put to work in a glass factory. This in itself is not startling, but it illustrates the new and progressive thinking of production men —thinking that is paying off throughout industry.

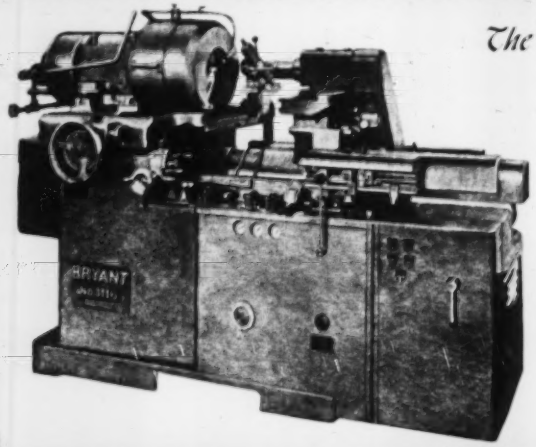
In this glass factory the old operation sequence consisted of rough lapping taper holes on cast iron laps; finish lapping male and female parts together as an assembly, then continuing these two parts through production to be shipped as a unit. Imperfection of one part meant scrapping both parts.

A Bryant No. 1116 internal grinder was put on the line. "As cast" or blown parts are chucked and then ground with a diamond wheel. In a matter of seconds the taper hole is ground so that it will "blue" a plug. The operator checks the piece in the machine and sends the part on. No mating is needed, as all holes are made to a standard and are interchangeable. Actual figures show that the new method is faster and cheaper and, at the same time, the final product is greatly improved because of the interchangeability feature.

This is an example of how well-established metalworking production methods can be applied to other industries. Bryant equipment grinds hole, O.D., and face, singly or in combination, in a single chucking.

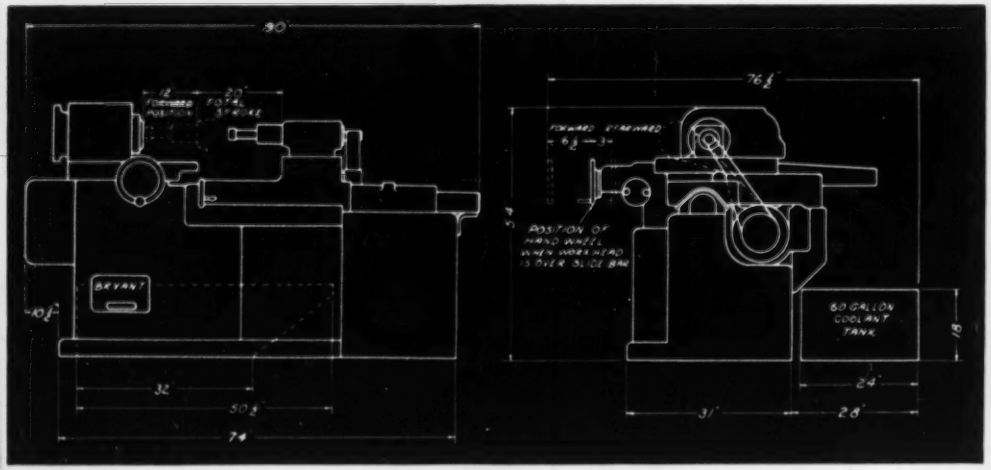
Bryant Chucking Grinder Company in Springfield, Vermont, U.S.A.

FOR HOLE GRINDING

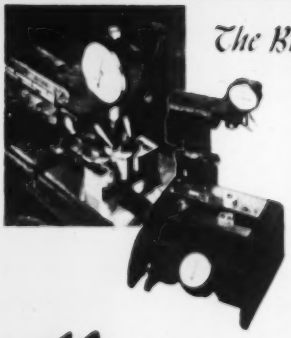


The Bryant 1116 Hydraulic Hole Grinder

This machine is for general purpose hole grinding. It has convenient centralized controls and all features necessary to handle a variety of work with minimum time and effort needed for changing jobs. For stable 3-point support, the wheel spindle is mounted on a cylindrical bar which is supported on 2 cylindrical bearings. The rear of the slide is supported on a hardened and ground guide plate. Workhead may be swiveled for grinding tapers up to 90° included angle. Provision is made for mounting a face grinding spindle in addition to the hole grinding spindle. The No. 1116 will swing 16" with 8" max. hole depth. Write for folder.



FACE SQUARE WITH INTERNAL THREAD



The Bryant Thread Gage with Squareness-of-Face Attachment

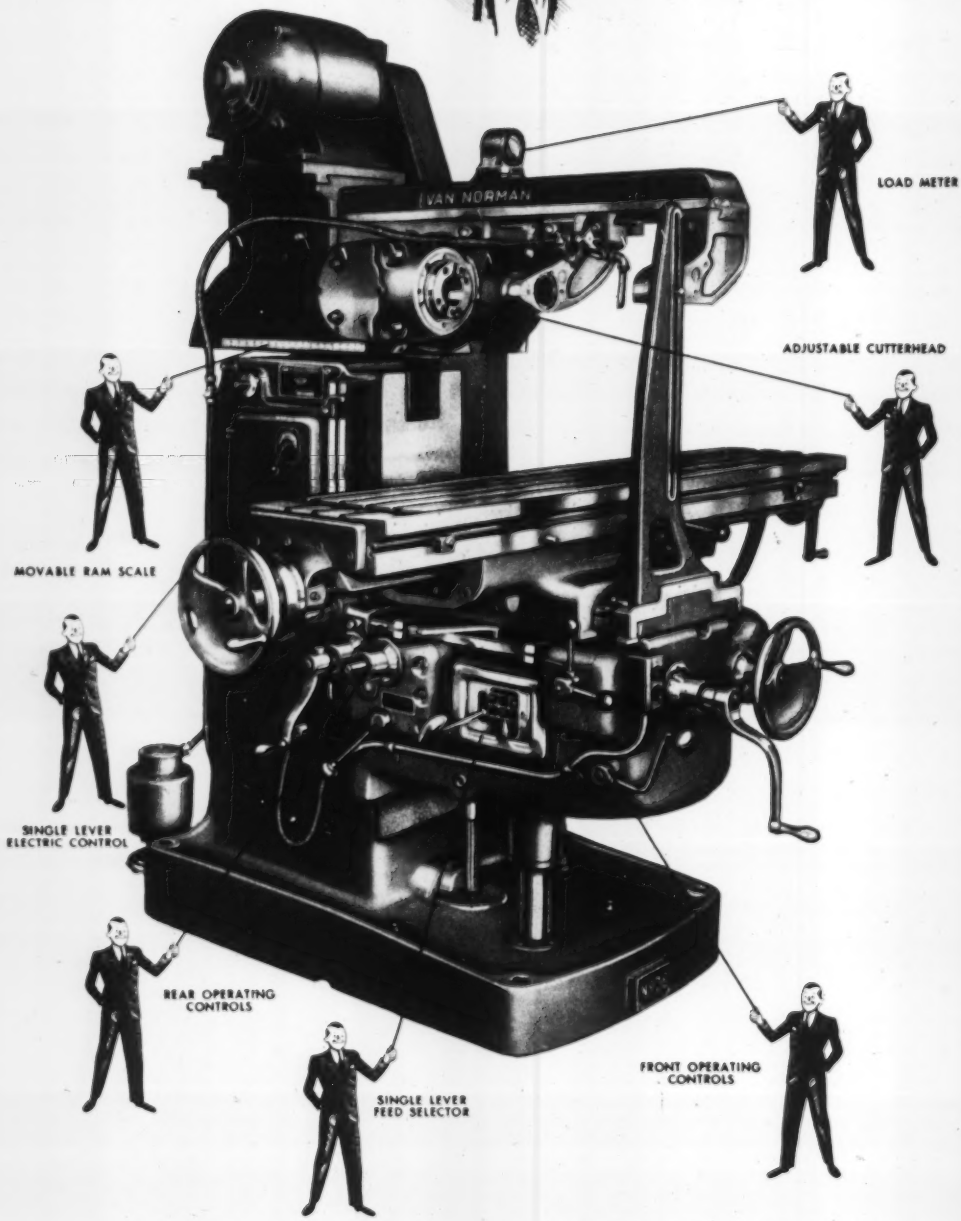
When a face must be checked square with an internal thread, the part should be held on the thread flank and rotated in this position. The Bryant Gage does this, regardless of variation in roundness, P.D., lead or thread form. The squareness-of-face indicator is raised by a yoke at a constant rate regardless of face run-out, thus giving a direct and exact reading of squareness with the thread axis. Simultaneous readings can be made — the Bryant Gage checks thread size — the Attachment shows face run-out.

Bryant Thread Gage gives accumulated reading of P.D., form and lead on dial indicator 4 to 5 times faster than plug gaging!

Bryant Chucking Grinder Company in Springfield, Vermont, U.S.A.

...A SIZE TO FIT EVERY NEED
...TO MEET SPECIFICATIONS
Measurement is only one type of precision in Midvale rings. The steel for every ring is made by Midvale—physical properties are precisely maintained throughout every step. The shaping and heat treating of Midvale rings are done by "old-hands"—craftsmen with years of experience who precisely machine and test with the most modern metal working and scientific equipment.
Result—rings precision-made in every detail . . . rings that stand the severest abrasive, crushing and grinding action called for by industry.
Whatever your needs for heavy equipment in industry Midvale can assure you of precision and performance. Whether it is roll shells for the mining and cement industry . . . pressure vessels for the chemical and petroleum industries . . . rolls for the paper industry . . . rings for turbines and gears . . . or castings and forgings for any industry . . . Midvale can make them to your most exacting specifications.
Pressure Vessels
Forgings and Rings
Hardened and Ground Steel Rolls
Corrosion and Heat Resisting Castings
Ordnance and Armor
THE MIDVALE COMPANY
NICETOWN, PHILADELPHIA, PENNA.
OFFICES: NEW YORK • CHICAGO • PITTSBURGH
WASHINGTON • CLEVELAND • SAN FRANCISCO
MIDVALE
Custom Steel Makers to Industry
PRODUCERS OF FORGINGS, ROLLS, RINGS, CORROSION AND HEAT RESISTING CASTINGS

Look at the



"IT PAYS TO VAN NORMANIZE"

Production Advantages of the

VAN NORMAN

RAM TYPE MILLER

Regardless of the type of plant or the type of work, Van Norman Ram Type Millers can cut your milling costs and speed vital production. These versatile millers reduce idle machine time by as much as 50% because they enable the operator to perform conventional horizontal, vertical and angular milling on *one* machine. Look at what Van Norman Ram Type Millers can do for you —

Adjustable Cutterhead

By merely positioning the cutter head, the operator can perform horizontal, vertical or angular milling . . . the work of three single-purpose machines.

Increased Work Range

Movable ram plus the saddle crossfeed increase the work range and capacity of the miller . . . enable you to handle larger work pieces with ease.

Front and Rear Controls

Operating controls are located at front and rear for ease of operation. They eliminate back and forth operator motion . . . reduce operator fatigue.

Simplified Electric Control

Built-in electric controls simplify operation. Single lever selector controls spindle, feed, and coolant. Push button, on front of knee, starts and stops motors as pre-selected.

Load Meter

Built-in load meter indicates percent of load at which the cutter is operating. It enables the operator to operate miller at maximum efficiency . . . helps to prevent overloading of the miller motor.

Any way you look at it, the Van Norman No. 38 Ram Type Miller is your best buy for cutting costs, increasing production and accuracy.

Van Norman Ram Type Millers are available from 37" to 64" table lengths.

Write for complete information, today.

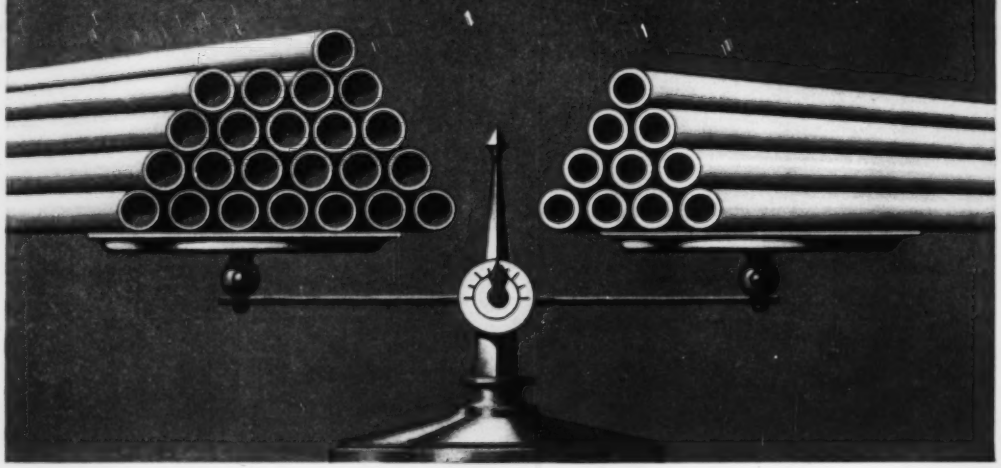
VAN NORMAN COMPANY

Springfield 7, Massachusetts

Sure Stainless Pipe is Tough to Get...

but...using light weight *Schedule 5* Pipe will almost double the supply

...and you pay less per foot!



What Schedule 5 Pipe Is—
A light wall pipe. Carpenter *Schedule 5* gives you more feet of pipe for every pound of scarce stainless steel. So you can quickly see how *Schedule 5* increases the amount of pipe available and reduces your cost per foot. Plus the fact that the larger I.D. means increased flow area.

How Schedule 5 Reduces Costs
First saving is 40% to 50% on the cost of your pipe. And, because *Schedule 5* lets you use the next smaller pipe size, you reduce by as much as 25% your costs of valves, fittings, etc.

How It Hooks Up With Tube
This pipe is easily adapted to use with existing lines of tubing or Schedule 40 and 10 pipe, using simple connectors available from several manufacturers.

Why It Means More Pipe
You get *more feet of pipe* for every pound of material with Carpenter *Schedule 5* Stainless Pipe. And we don't have to tell you how important it is to get *more steel* from every pound of nickel and chrome these days.

Data Sheets give you complete information about Carpenter *Schedule 5* Stainless Pipe. Write for your personal copy.

Carpenter

THE CARPENTER STEEL COMPANY
Alloy Tube Division, Union, N. J.
Export Department: Carpenter Steel Co., Reading, Pa. "CARSTEELCO"

STAINLESS TUBING & PIPE

Analysis → Tolerance → Finish →

- guaranteed on every shipment

RESISTANCE WELDING HIGH-TEMPERATURE ALLOYS?

General Electric can help you in the proper selection of resistance welding control—single-phase and three-phase

Are you faced with resistance welding high-temperature, high-strength alloys or aluminum for defense production? Trying to decide between three-phase and single-phase welding control? Write for G-E literature that describes both types. We know, from experience in our own as well as customers' plants, that both are being used. Which *you* select will depend to a great extent on these factors:

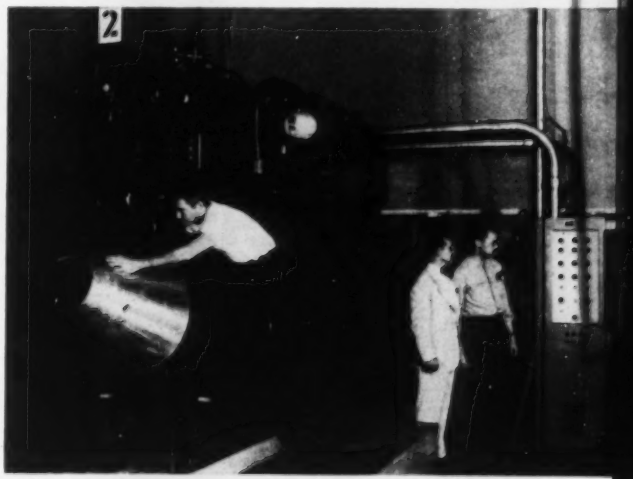
COMPARE SINGLE-PHASE AND THREE-PHASE

Single-phase	Three-phase
1. Low initial cost	1. Low KVA demand
2. Low maintenance (easy)	2. Balanced 3-phase load
3. Simple to operate (few adjustments)	3. High power factor
4. Wide industry use	4. Inherent slope control action
5. Voltage and current regulators can be added later	
6. Slope control can be added if necessary	

General Electric has supplied, and used, both types to meet Army-Navy specifications, and our nearest local office can give you information based on experience with this equipment and with welding high-strength alloys. Before you buy—investigate. Write for bulletin GED-1512, or contact the nearest G-E sales office. *General Electric Company, Schenectady, N. Y.*

Ask your resistance welding manufacturer, power supplier, or nearest General Electric office for a FREE showing of the sound and color movie, "This Is Resistance Welding." Describes various welding methods and processes. For production and engineering personnel training and refresher courses.

H. C. Wolfe, of the General Electric Electronics Laboratory Welding Section, says, "Tests in our Laboratory and in other General Electric Welding Laboratories showed that single-phase a-c welding using Slope Control was as good as three-phase welding on aluminum. So, for Class A spot welding of aluminum, the use of our a-c machine with Slope Control certified to Military Specification MIL-W-6860 for .125-.125" 52S$^{1}_{4}$H aluminum has resulted in a considerable saving of money and time."



Three-phase at Ryan Aeronautical Company in San Diego controls several of the largest resistance welding machines in the country. With G-E 3-phase control exact heat settings can be obtained and duplicated later without variation. Uniform current is fed to the electrodes to produce the required heat with less momentary line load. Unidirectional spot-welding is also obtained—advantageous when welding sheets of different thicknesses.

GENERAL ELECTRIC

045-55

JET BLACKS

Zinc plated typewriter key levers are a typical example of how the EBONOL "Z" process provides an adherent, jet-black inorganic oxide finish to all types of zinc plated surfaces.

*Reg. Trade Mark

For blackening metals use ENTHONE EBONOLS

EBONOL "S" Processes for blackening steel to produce jet-black oxide coatings. Simple and economical to operate. Operating temperatures: EBONOL "S", 285-290°F., EBONOL "S-30", 295-305°F.

EBONOL "C" The quality black for copper and brass that meets all military specifications. Produces cupric oxide finishes that are stable, adherent and protective.

EBONOL "Z" A durable, deep, rich finish for zinc plate or zinc alloy castings. Dull or glossy oxide black coatings are formed in from 5 to 10 minutes at 160-180°F.

U. S. PATENT NOS. 2,364,993. 2,460,896. 2,460,898. 2,481,854.

Write to Enthone, Inc. for information and advice on any blackening process and ask for check list of Enthone literature on over sixty products and processes for better electroplating and metal finishing.

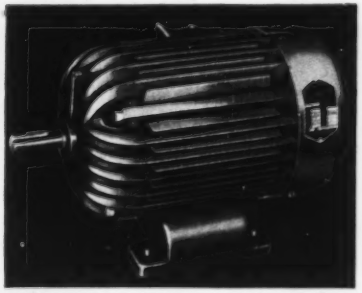
METAL FINISHING PROCESSES

ENTHONE

ELECTROPLATING CHEMICALS

442 ELM STREET
NEW HAVEN, CONNECTICUT

Horsepower with Staying Power



General-purpose motors. A widely varied choice of *Capacitor-Start, Split-Phase and Poly-Phase Motors.*

Special-purpose motors. For pumps, oil burners, fans and blowers. Motors that in all probability will meet your specifications "as is."

Ask your distributor, or write us direct.

There are a lot of different motors with the same rated horsepower. Much the same looks, too. And about the same price.

But put them to work where the going is tough—"torture the truth out of them"—and surprising points of difference show up.

Hoover welcomes such a comparative test. Many manufacturers have picked Hoover Motors to power their products because of facts discovered in just this way.

When you put a Hoover Motor through its paces, you find horsepower with endurance. And when you take one apart and look at its "muscles," you easily see why.

In each mile of precision wiring, in every working part, Hoover Motors are built with what it takes for cooler running, quieter operation, more reliable power, longer life on the job.

And Service? *When* it's needed, *where* it's needed, Hoover's service facilities are world-wide—always ready to protect your customers and to guard your good name.

HOOVER® electric motors

since 1934

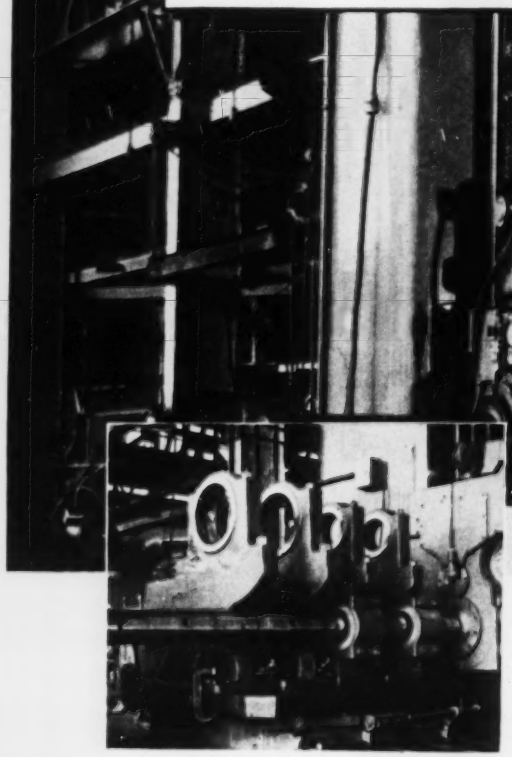
THE HOOVER COMPANY

Kingston-Conley Division

42 Brook Avenue North Plainfield, New Jersey

Machine time cut from

ON COMPLEX TROUGH STAND FOR



Close-up of finish-boring operation on bearing seats. Note rotary table used to rotate workpieces—reduce setups.

Photos and job data — Courtesy Baker-Perkins Co., Saginaw, Mich.

The former time for this job was 24 hours. Then a G&L Job Analysis was made. Result — a 560-T (6" Table Type) G&L Horizontal Boring, Drilling and Milling machine was recommended — together with a G&L rotary table. Now the user sets up workpieces two at a time — and using only three setups completes 4 parts and completes the job in 12 hours . . . at 50% savings in time alone!

GIDDINGS & LEWIS

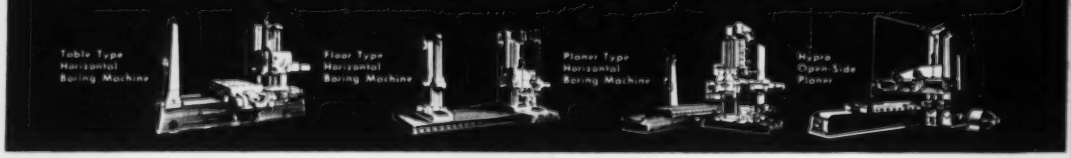
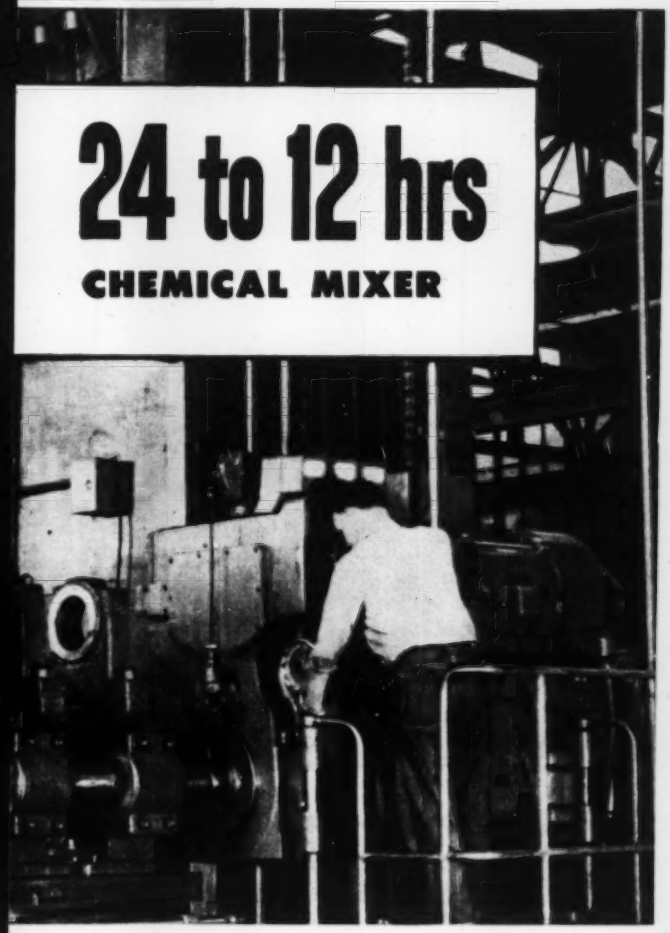


Table Type Horizontal Boring Machine
Floor Type Horizontal Boring Machine
Planer Type Horizontal Boring Machine
Hydro Open-Side Planer



24 to 12 hrs

CHEMICAL MIXER

You'll find that regardless of the part or parts . . . big or little — simple or complex, you'll save time and money with the G&L line. Maybe you will want a G&L Horizontal Boring, Drilling and Milling Machine — or a G&L Hypro Planer, Planer-Miller or Vertical Boring Mill . . . but whatever your need, you can be sure that G&L's unbiased Job Analysis Service will give an answer that will mean savings to you. See our nearest representative or write direct. Get the facts about a G&L Job Analysis today — there's no obligation . . . and DELIVERY ON G&L's MACHINES . . . MIGHT BE BETTER THAN YOU THINK!

G&L 5-POINT JOB ANALYSIS

takes the guesswork out of machine tool buying . . works for you and with you to solve big or complex machining problems..increases production . . reduces machining costs

1 **COMPLETE STUDY OF YOUR JOB OR JOBS** — G&L Job Analysis Engineers, working with your engineers, analyze your requirements by: (1) number and size of parts to be produced, (2) number and kind of operations needed, (3) tolerances and finishes required.

2 **DETERMINE MOST EFFICIENT MACHINING METHOD** — Taking into consideration the individual machining requirements of the job, G&L Job Analysis Engineers choose the most efficient machining method. G&L engineers can give an unbiased opinion because G&L builds a complete line of sizes and types of planers, planer-millers, vertical boring and turning mills and horizontal boring, drilling and milling machines . . . plus a complete line of accessories and tooling for these machines.

3 **SELECT THE SIZE, KIND AND TYPE OF MACHINE**—The machining method now determined, G&L Job Analysis Engineers — using your production and work requirements — recommend the exact size, kind and type of machine that will do the job most efficiently.

4 **PLAN YOUR OPERATIONS** — After the selection of the most efficient machine to fit your needs, G&L Job Analysis Engineers plan a sequence of operations that will (1) minimize number of setups and setup time, (2) use modern cutting tools to best advantage, (3) take full advantage of the machine working ranges and capacities, (4) keep operator fatigue to a minimum.

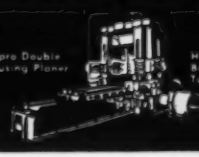
5 **RECOMMEND (AND DESIGN IF NECESSARY) THE TOOLS TO USE** — If conditions warrant, G&L will recommend the standard machine accessories, arrangements and tools you can use to make your equipment more productive—more versatile in application. If special equipment is needed, it will be designed to agreed specifications and made a part of your order.

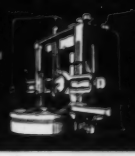
Write, wire or phone G&L or its nearest representative today. Get the facts on your needs — your problems. Get a G&L unbiased Job Analysis to help you. Don't hesitate — there's no obligation . . . AND DELIVERY MAY BE BETTER THAN YOU THINK!

How to get a G&L job analysis

Call your nearest G&L dealer or write us direct. Furnish our Job Analysis Engineers with blueprints, job data, and production requirements. Factory engineers will completely analyze your machining problems. There's no charge, no obligation. Don't hesitate — do it today.

MACHINE TOOL CO.





G&L HYPRO

FOND DU LAC
WISCONSIN

6" TANDEM WIRE FLATTENING MILL

Speeds — 1000 F. P. M. and up . . .

FOUNDED WATERBURY FARREL 1851

A Precision Mill of Improved Design

with Reciprocating Winder, Pay-off Stand, complete electrical control, and dancer rolls to provide Constant Wire Tension.

Also available either as a single unit machine, or with more than two stands, as required.

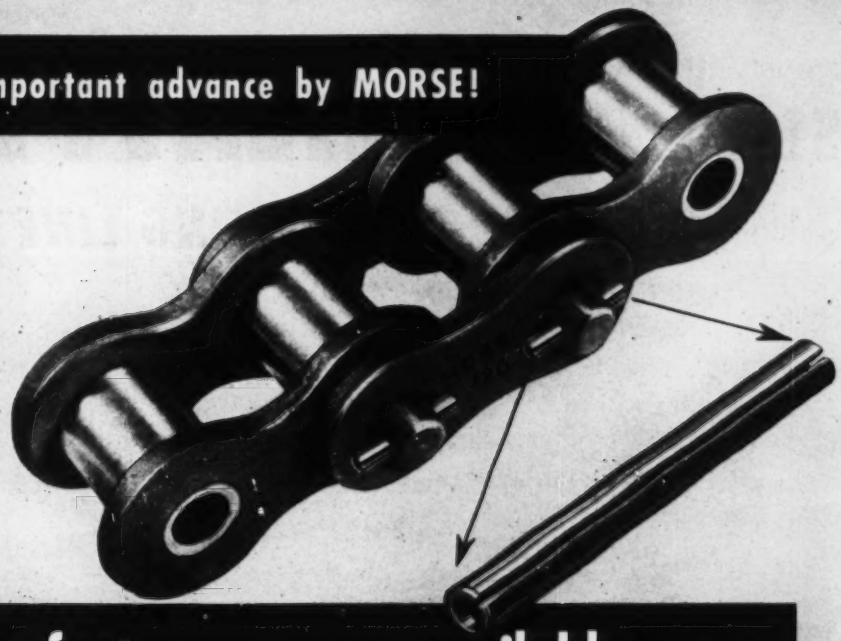
Our experience in the development of Rolling Mill equipment is always at your disposal. . . . . *Just Write!*

Waterbury Farrel

FOUNDRY & MACHINE COMPANY

WATERBURY • CONNECTICUT • U.S.A.

Another important advance by MORSE!



Rollpin fasteners now available on five sizes of MORSE Roller Chains

Now, Morse gives you this tested, proved answer to cotter-pin failure in roller chains. It's the Rollpin, most reliable, longest-lived fastener ever incorporated into a power transmission chain.

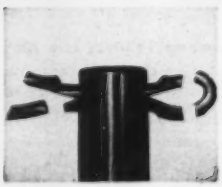
The Rollpin is a chamfered-end, heat-treated, slotted steel cylinder that is compressed into a pin hole smaller than the Rollpin's own diameter. The Rollpin expands and locks into place until deliberately removed by hammer and punch. It can't fatigue out even under the most severe working conditions.

The Rollpin is another outstanding example of Morse Roller Chain leadership that has already given you the benefits of shot peening and many other advanced metallurgical refinements.

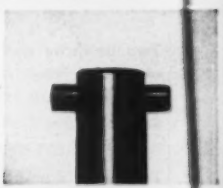
At no increase in price, Rollpin fasteners are currently available in most of the larger pitches of both standard and heavy-series Morse Roller Chains. If you have been experiencing cotter-pin failure, specify Morse Roller Chain *with Rollpins*. Standard cotter-pin chains are available and will be furnished unless otherwise specified.

M = PT Morse *means* Power Transmission

Rollpins outlast standard cotter pins more than ten to one!



Standard heat-treated cotter pin after only 3 hours on fatigue tester.



Rollpin after 50 hours on fatigue tester. It will outlast any other fastener on the market.

MORSE
MECHANICAL
POWER TRANSMISSION
PRODUCTS

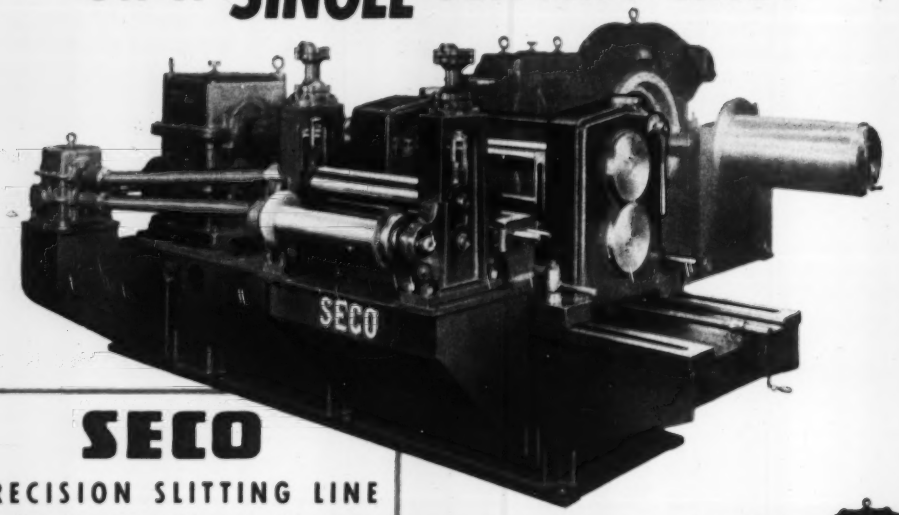
BW
PRODUCTS OF BORG-WARNER

MORSE CHAIN COMPANY

Dept. 304, 7601 Central Ave. • Detroit 10, Michigan

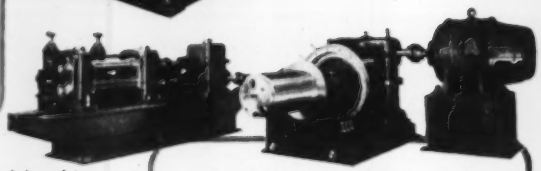
SLIT LIGHT and HEAVY STRIP

ON A SINGLE SLITTING LINE!



SECO

PRECISION SLITTING LINE
Handles ALL Gauges from .010" to .125"
With Exceptional Accuracy and Speed



Combination Pull-Thru and Power-Driven Line Gives Unusually Wide Range

Two or three narrow-range slitters can be replaced by this one SECO Precision Slitting Line. This extremely versatile line slits all gauges from .010" to .125"—cold-rolled steel, brass or aluminum. It is highly accurate—and handles all thicknesses on a fast, profitable production basis.

This particular SECO Line is designed for 24" wide strip in coils weighing up to 6,000 pounds. It makes 24 cuts in gauges up to .035" at line speeds from 400 to 1200 FPM—and handles strip up to .125" at speeds from 150 to 400 FPM, making up to 14 cuts.

SECO Slitting Lines, modern in design and rugged in construction, can be built with many efficient features. For more information on SECO Slitting Lines, or the answer to your specific slitting problem, write today. Our engineers will be glad to furnish full information and data—with no obligation to you.

Both the slitter and recoiler on this SECO Precision Line are driven from one 40 HP AC/DC adjustable speed motor. The slitter can be used as either a "pull-thru" type—for finer gauges up to .035" or "power-driven" for heavier gauges up to .125". The slitter has eccentric rotary box type arbor mountings—to accommodate any knife diameter—with Timken tapered roller bearings. The design can easily be adapted for your particular requirements.

STEEL EQUIPMENT CO. P.O. Box 737, Warrensville Station, Cleveland 22, Ohio

SECO

DESIGNERS and BUILDERS of the following STEEL MILL EQUIPMENT

Leveling and Shearing Lines . . . Combination Edging and Flattening Lines . . . Tension Reels for Strip Polishers . . . Narrow Strip Grinding Machines . . . Multiple Strand Pull-Out Rolls and Take-Up Frames . . . Strip Coilers of the Up and Down Coiling Types . . . Traverse Reels for Narrow Strip . . . Scrap Ballers.

Take advantage of exclusive P&H AC Dial-lectric principle

give your production a lift

— with safe, open-circuit voltage . . . easy, quick-start arc . . . time-saving, built-in remote control . . . compact AC design

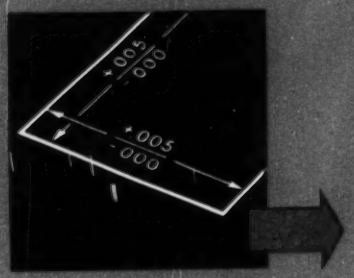
Armor plate welding calls for low-hydrogen or stainless steel electrodes. P&H, pioneer in the low-hydrogen field, also offers the AC welder that gives you the best weldability with these rods — for greater production.

Your men like the P&H AC Dial-lectric — like its safety under the most adverse conditions; like the easy, quick-start arc, the elimination of arc-blow. And they get more done! Get sounder, better looking welds in less time, thanks to built-in remote control which lets them select the right heat at the work, turns *walking time* into *welding time*.

Because these welders give production such a lift, P&H has stepped up its delivery schedules to meet defense demands without delay. Get your production rolling in high gear. Order your P&H AC Welders today. Capacities up to 650 amps. Take advantage of this delivery situation while it lasts.

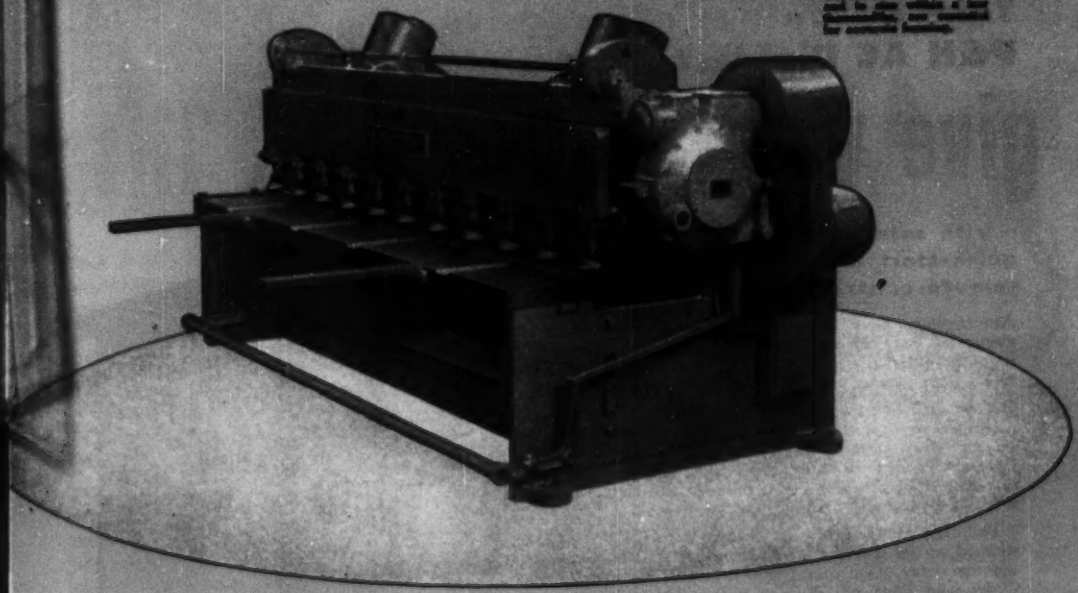
P&H WELDING DIVISION
4411 W. National • Milwaukee 14, Wis.
HARNISCHFEGER CORPORATION

Outstanding Accuracy



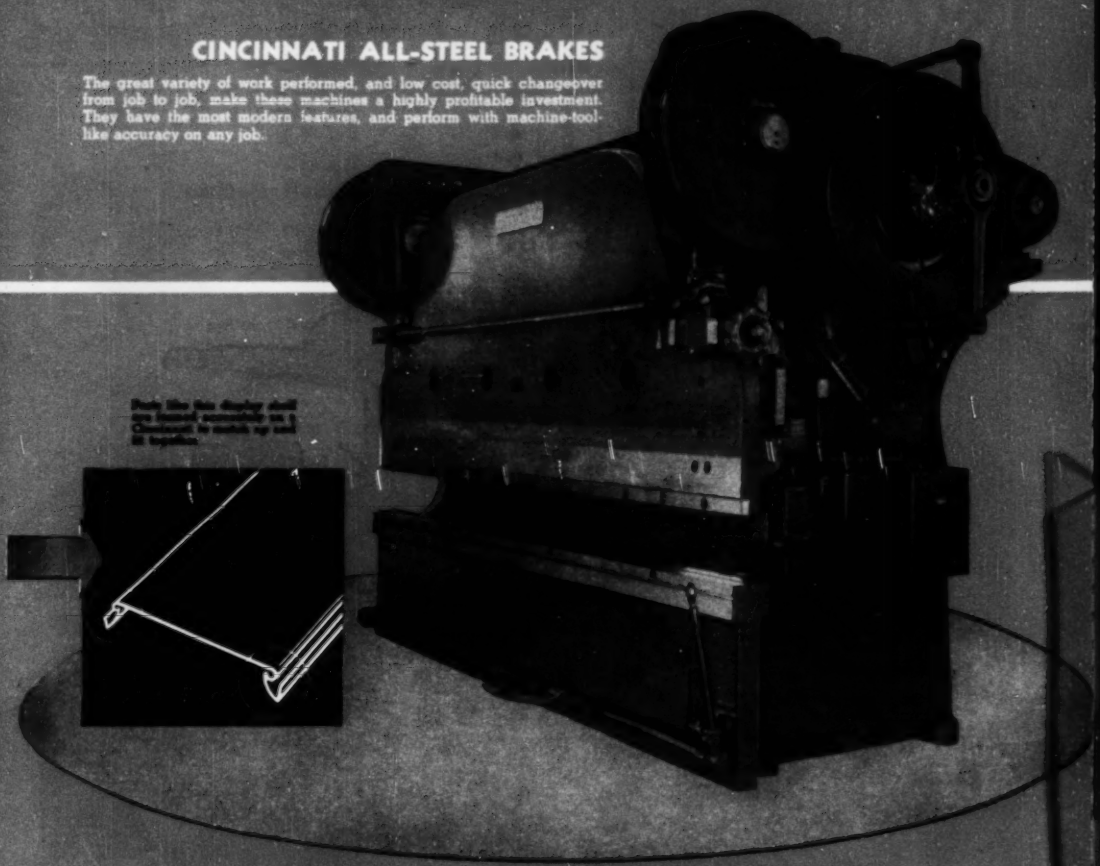
CINCINNATI ALL-STEEL SHEARS

These modern machines have up-to-date controls, accurate and rapid gauging devices, and powerful and efficient hydraulic holddowns. Cincinnati All-Steel Shears cut straight and clean, and have every convenience for rapid and accurate shearing.



CINCINNATI ALL-STEEL BRAKES

The great variety of work performed, and low cost, quick changeover from job to job, make these machines a highly profitable investment. They have the most modern features, and perform with machine-tool-like accuracy on any job.



THE ALL-STEEL TEAM of Cincinnati Shears and Cincinnati Press Brakes brings outstanding accuracy to the shop.

Without accuracy, manufacturing plans go wrong, production snarls, and profits fade.

With accuracy—discards, reworks and waste are out, and all along the production line parts fit accurately and speed assembly.

Cincinnati Shears cut accurate blanks and Cincinnati Press Brakes form accurate shapes. You save time, improve the product, and increase profits when you use the All-Steel Team—Cincinnati Shears and Cincinnati Press Brakes.

Write for Shear Catalog S-68, describing the Cincinnati Line—lengths from 4 feet through 24 feet, and capacities from light gauges through 1¼-inch plate.

Write for Press Brake Catalog B-48, describing the Cincinnati Line—lengths from 2 feet to over 20 feet, and capacities from light gauges to 1000 tons.

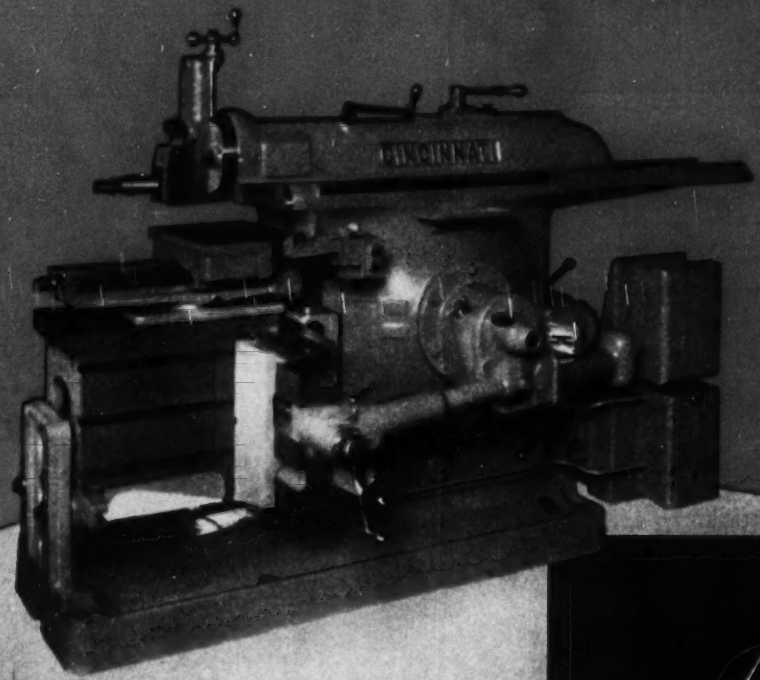
Our Engineering Department will be glad to advise you on your shearing and forming problems.

THE CINCINNATI SHAPER CO.

CINCINNATI 25, OHIO, U.S.A. SHAPERS • SHEARS • BRAKES

CINCINNATI

Outstanding Accuracy



Dovetailing is just one of the many jobs easily done by this Handy Man of Industry.

CINCINNATI Shapers are *outstanding* in *accuracy* because solid, extended runways, rail and apron design, individual cam feeds, gibbed adjustments and other exclusive features increase rigidity, decrease wear, and give extra strength.

You make money with a Cincinnati because work is produced more accurately and faster. The new Cincinnati electro-magnetic clutch is just one of the controls that make this the fastest shaper in setup and operation on the market.

Write for Catalog N-SR, describing the Cincinnati Line, ranging from 16 inches to 36 inches, and including plain, universal and special models.

THE CINCINNATI SHAPER CO.

CINCINNATI 25, OHIO, U.S.A. SHAPERS • SHEARS • BRAKES

STEEL

The Metalworking Outlook

April 14, 1952

Aluminum Next?

Almost as alarmed as steel executives over the President's seizure of the mills are aluminum industry officials. They could be next. A WSB panel has completed the usual hearings concerning labor's plea for more money and other concessions from makers of the light metal. Many of the aluminum industry employees are represented by the United Steelworkers of America whose demands are similar to those presented to the steel companies.

No Help from Congress

Don't expect much to come from President Truman's oblique request to Congress for legislation backing him up in the steel seizure. Congress has already passed by one opportunity to oblige in approving only a limited extension until June 1 of certain emergency powers that expire when the Japanese peace treaty goes into effect. The extended powers limit seizure authority to public utilities.

Some Unions Oppose Seizure

At least three unions—railroad brotherhoods—oppose government seizure. In a long brief before Federal Judge Emerich B. Freed in Cleveland, labor lawyers claim that federal seizure of the railroads has increased rather than lessened strikes. In 1951, a year of U.S. control, 24 strikes of record occurred on railroads, more than in any year since the Railway Labor Act was passed in 1926. The three brotherhoods want a return to normal collective bargaining.

Deadline on Renegotiation

Due May 1 is your summary of sales of renegotiable items. More than a year has elapsed since the Renegotiation Act of 1951 was passed, and the regulations and procedures are still being hammered out. Because no company with defense business in 1951 can be sure what war profits the Renegotiation Board will allow, many have set up contingency reserves in their 1951 statements to allow for any possible refunds. The practice is challenged in some quarters on the ground that it automatically tells the board the sum a company is prepared to return.

Shift in Point Four

A shift is occurring in the Point Four program. Up until now, emphasis has been on technical and financial assistance to foreign countries in agriculture, health, education and transportation. Now, industrialization will get a greater play. W. Averell Harriman, who heads the show, has established an interagency committee to examine ways and means of encouraging private companies in the U.S. to invest abroad. To date, the most ambitious Point Four industrialization schemes are in India, Pakistan and Brazil. In the works are plans

Production-Engineering News—p. 91 *The Market Outlook—p. 171*

for Point Four industry in Colombia, Chile, Bolivia, Peru, Ecuador and Venezuela.

Resources Survey?

Watch for more pressure for a top-level survey of our total resources, to determine the proper limits for foreign aid and domestic and military programs. The idea was advocated in STEEL, Jan. 7, p. 117, and it's now taken up by Secretary of Commerce Charles Sawyer. "Short of all-out war," he says, "it may be well to review our situation, survey our balance sheet and set some limit to the expenditure of our money and resources." The idea would be to have prominent economists, business men and international experts on a commission-type board to study the situation.

Puerto Rico: Labor Pool

Need labor? A relatively untapped pool could be Puerto Ricans. New York is less than eight air hours away from the island. The islanders are U.S. citizens and could be flown to your plant. Some Midwestern companies are already using them successfully. The territory has set up New York, Chicago, Los Angeles and Washington offices to handle inquiries on the matter. If you are seriously considering Puerto Ricans as workers, first get clearance from your local state employment service office.

More Roads—in 1953

Federal aid for roadbuilding may increase, not decrease, for fiscal 1954 and 1955. A House Subcommittee on Roads recommends increasing federal aid funds to $550 million annually. An Administration proposal would reduce the help to $400 million annually. Probable final result: A definite increase in roadbuilding starting in mid-1953. The total American outlay for all roads may reach $3 billion annually by 1954.

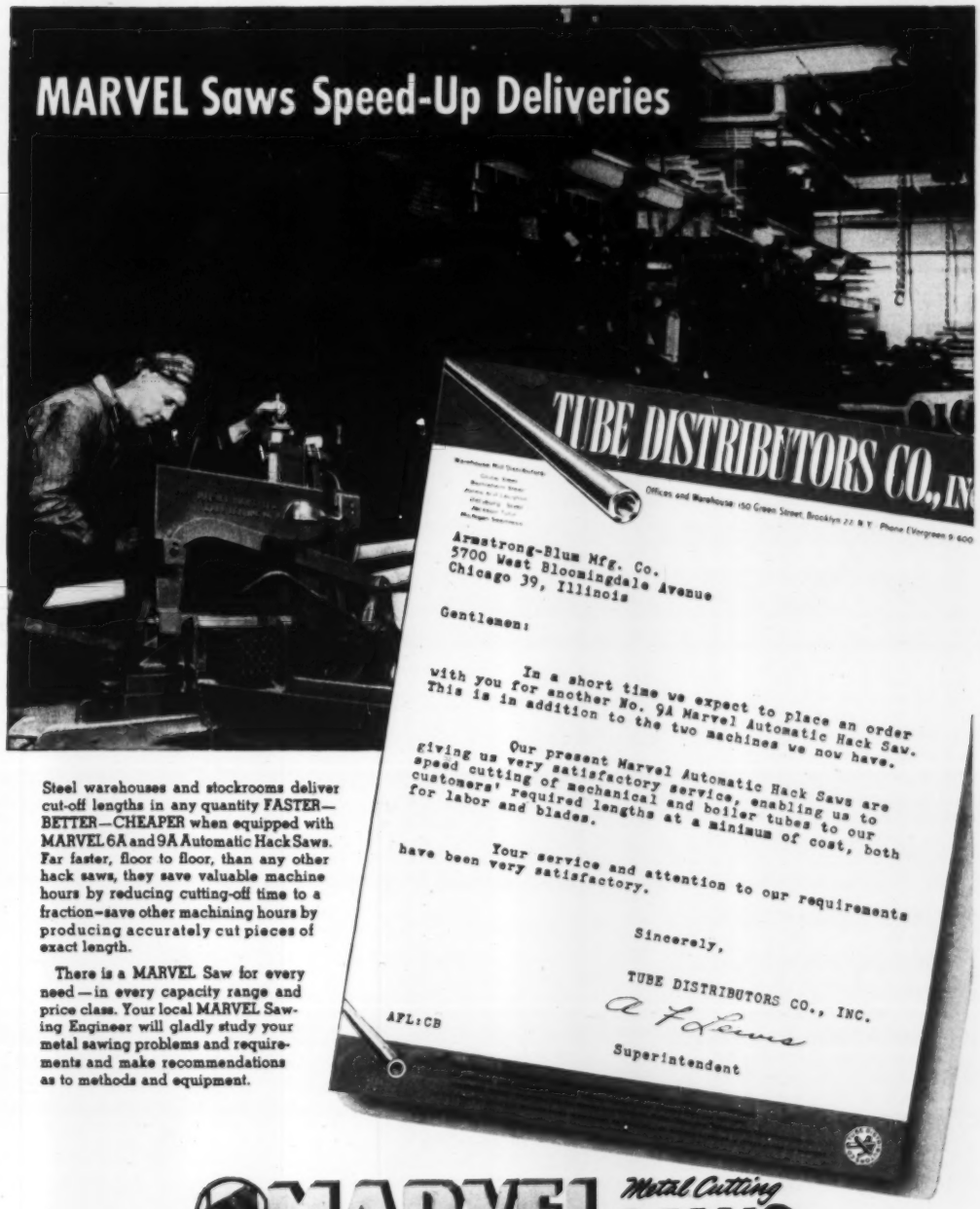
Straws in the Wind

Dearborn Motors Corp., marketing organization for the Ford tractor and Dearborn farm equipment, has paid Harry Ferguson Inc. $9,250,000 in complete settlement of the $342 million lawsuit brought by Ferguson . . . All regulated articles costing less than $100 are now exempt from down-payment requirements of Regulation W . . . Ownership of the government magnesium foundry at Teterboro, N. J., would be transferred to the Navy under S.2223, reported favorably to the Senate by committee . . . You have until June 10 to protest proposed changes in regulations issued under the Walsh-Healey Public Contracts Act . . . Foreign iron ore imports are rising—24 per cent last year to almost 11.4 million net tons.

What Industry Is Doing

Mr. Truman's figures for steel profits are more fancy than fact (p. 63) . . . Average steel inventories are three to four weeks (p. 65) . . . Largely overlooked in the hubbub of the steel case are the "who's going to run the business" issues which may turn out to be the most important of all (p. 65) . . . Makers of nonferrous castings (other than die) expect a 5 to 10 per cent increase in shipments this year over 1951 (p. 67) . . . Russia's steel industry moves eastward (p. 73) . . . How one purchasing agent makes out (p. 74).

MARVEL Saws Speed-Up Deliveries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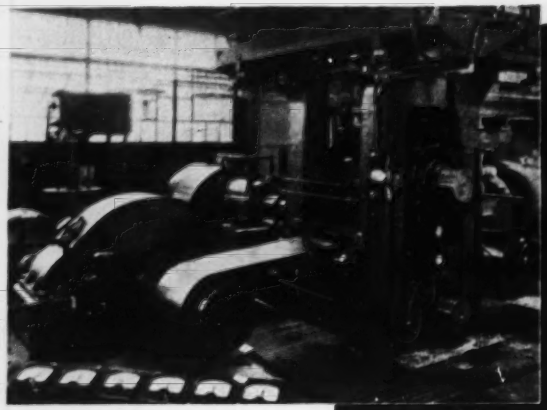

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It Can Happen Here

Harry Truman, a dictator? "Oh, No!" you say. "The little man from Missouri cannot be a dictator in these United States. Ours is a free country. Dictators cannot thrive here."

Can't they? After that bizarre performance of last Tuesday night, when Mr. Truman uttered more outright falsehoods than have ever been heard in a single address by a President in this nation's history and when he seized the steel industry, one can believe that anything—including dictatorship—can happen here.

If this were Mr. Truman's first offense, it could be overlooked. But it is not an isolated case. It is one of a long series of assaults against the constitution.

He tried to force railroad employees to work at the point of army bayonets and almost succeeded. He plunged us into war in Korea without consulting Congress or the people. He ordered the Secretary of Commerce to ignore a contempt of court action in the odorous case of confiscation of the Dollar Line properties by the government. He has made seizure of the railroads a routine farce. Now he has taken an even bolder step. He has ordered the Secretary of Commerce to "take possession of the steel mills."

In all of these cases he has acted upon vague "inherent" rights of the President without regard to the specific rights of individuals which are spelled out in Articles IV and V of the original amendments to the constitution. These provide that the right of the people against unreasonable seizure shall not be violated and that no person shall be deprived of property without due process of law.

The present steel mess brings to the forefront the vital question of whether we are going to permit the office of the President to proceed further into its already deep invasion of the rights of individuals. It is simply a matter of safeguarding the rights of the people against abuse of power by the President.

An odd turn of fate has dumped into the lap of the steel industry a golden opportunity to destroy the seeds of a potential dictatorship. The nation will applaud its fight for freedom!

E. C. Shaner

EDITOR-IN-CHIEF

WHITE HOUSE TRICKERY: For plain, impudent demagoguery one could look far and long without finding anything that would even remotely equal President Truman's comment on steel industry profits. In his Tuesday night talk to the people he told them that the steel companies are making a profit of $19.50 per ton of steel. Nowhere in his discussion did he explain that he meant $19.50 per ton before taxes.

This was a deliberate, malicious deception.

He knew he was talking to millions who would not question his figures and he used the prestige of his high office to put over a gross misrepresentation. If the executives of any industrial corporation were to be equally careless in the presentation of facts in regard to its financial affairs, they would be summoned into court and fined heavily and sent to jail.

Actually the steel companies made a profit of $6.67 per ton and they paid $12.46 per ton in taxes. The total, $19.13, corresponds to the President's tricky $19.50.

* * *

HARD JOB WELL DONE: For a private citizen to address a nationwide audience to refute the erroneous statements of a President of the United States is an extremely difficult and responsible undertaking. One is torn between a respect for the high office of the Presidency and the necessity of making it possible for the people to know the truth.

Faced with this quandary last Wednesday night, Clarence B. Randall, president of Inland Steel Co., resolved it courageously. He chose not to make answer to the President, but to "Harry S. Truman, the man." "I shall not," he said, "let my deep respect for the office he holds stop me from denouncing his shocking distortions of fact. Nor shall I permit the honor of his title to blind the American people from the enormity of what he has done."

These were words that had to be said. Mr. Randall was magnificent in his difficult role.

* * *

FINICKY ABOUT PRICE: In recent years, a purchasing agent's lot has not been a happy one. A constant stream of emergency situations has caused him to deviate sharply from his normal function. He has been particularly plagued by shortages.

James W. Farrell, director of purchases for Mullins Mfg. Corp., has not permitted these abnormal problems to divert him from the main function of a good purchasing executive. His conception of a purchasing agent's job is "to get what is wanted when it is wanted at the most beneficial ultimate cost."

Underline "beneficial cost"! The conditions which forced many buyers to disregard the cost factor in recent years are on their way out. We are at the dawn of a period in which the purchasing agent again will be extra fussy about the price he pays.

* * *

VITAL SALVAGING JOB: An acute shortage of industrial diamonds confronts the nation. The problem revolves around the fact that the supply of crushing bort—the type of industrial diamond largely used in grinding wheels—has fallen far short of demand.

About 96 per cent of our industrial diamond requirements are supplied by Africa. Three-quarters of this need is in the form of crushing bort. Grinding wheels use 80 per cent of the crushing bort available. In the present circumstances, salvage is terrifically important. Diamonds never wear out. In wet grinding, a substantial percentage of the urgently needed diamond materials can be recovered from sludge collected in a settling tank.

If you use abrasive wheels extensively, look into the matter of reclaiming valuable material from sludge or from other methods of salvage. It is our only way out of a serious predicament at this moment.

* * *

HANDLING, PACKAGING: One of the most significant trends in industrial management is the increased amount of attention being focused upon the closely related problems of materials handling and packaging. There is no mystery about the increased emphasis being placed upon these problems. The incentive for it is a substantial saving in costs. It is estimated that between 30 and 60 per cent of the cost of many manufactured items can be accounted for by the functions of handling and packaging.

There are impressive figures to support these estimates. General Motors alone spent $42 million for packaging last year. Its 35 manufacturing divisions received 42.5 billion pounds of materials. Before being used and shipped, much of this poundage was handled from 30 to 50 times. Del Harder, Ford vice president of manufacturing, ventures the guess that American industry spends $9 billion a year just moving materials from place to place. What an opportunity for cost savings!

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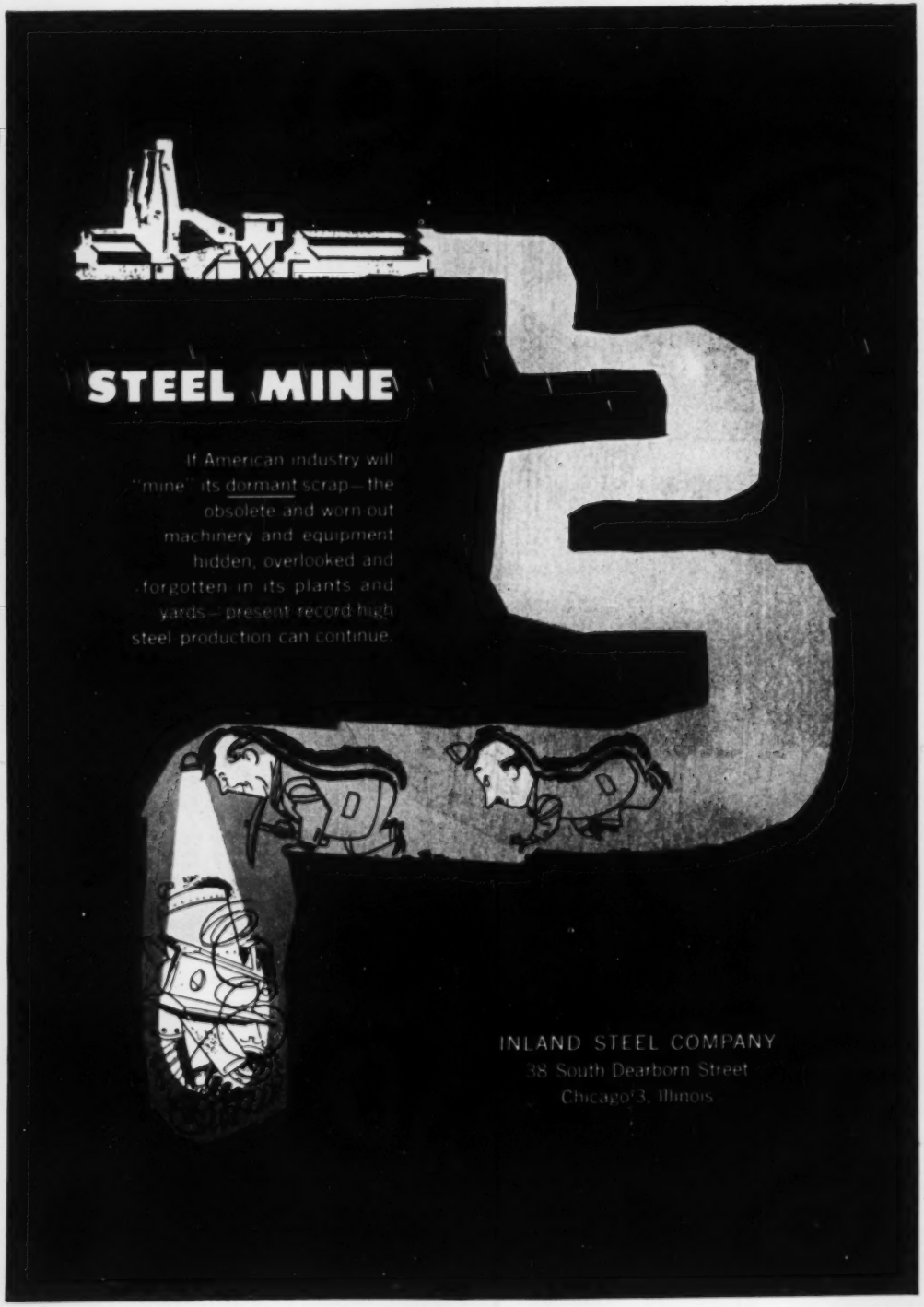
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United Press

Oh, say does that
Star Spangled Banner
Yet wave
O'er the land
Of the free . . . ?

Inland Steel's Clarence B. Randall

Flag flies over U.S. steel industry

United Press

Steel Seizure: Indignation Soars

President Truman's act may swing public sentiment sharply against labor and could bring the end of Big Union's strong influence in Washington

WILL public reaction to President Truman's seizure of the steel industry reverse political trends of the past two decades? Will the pendulum swing away from dictatorial government, from collusion between powerful labor unions and the national administration, and from abridgment of freedoms?

These are some of the questions and hopes pondered by sober metalworking executives as indignation over the seizure continues.

Seldom has any act by a President met with such bitter criticism from the nation's press, industry, many congressmen and citizens as has U. S. handling of the steel dispute.

Turning Point—Many observers believe this action will be the turning point in the public's willingness to go along with the political thinking of the administration.

Meanwhile steel companies settled down to what may be a long legal contest of the constitutionality of the President's action. Few believe that a final decision can be handed down in time to have much bearing on the immediate steel seizure case.

Under the Flag—Steel mills are operating under government seizure and Secretary of Commerce Charles Sawyer was directed by the President to "prescribe terms and conditions of employment." Although Mr. Sawyer indicated that he will not immediately negotiate a contract between the government and the union, the directive will be used as a stick over steel.

Operations at the seized plants resumed to a near-normal pace by week's end. Loss in production due to the threatened strike and the seizure is about 1 million ingot tons.

Steel Hits Back

Seizure of the mills was called a "corrupt political act" to discharge a political debt to the CIO by Clarence B. Randall, Inland Steel

Steel Profit Facts: Not as Mr. Truman Fancies

STEEL Magazine challenges President Truman's method of computing the earnings of the steel industry.

In his radio and television address to the nation April 8, he said: "The steel companies are now making a profit of about $19.50 on every ton of steel they produce."

This is a loose usage of figures. And nowhere in his speech was there any qualification of these figures.

STEEL's annual financial analysis of the steel industry for 1951 (to be published April 21) shows that companies having 95 per cent of the country's steelmaking capacity had a net income of only $6.67 per ton of ingots produced.

The analysis further shows that federal income and excess profits taxes amounting to $12.46 per ton of ingots produced were paid by the industry. Net income, plus federal taxes, amounted to $19.13 per ton of ingots produced.

Obviously, the President is including in earnings figures the amount the federal government takes in taxes. This is unrealistic. Taxes are a part of the cost of doing business and a cost over which the industry has no control.

The President just as well might cite earnings before wages as profit before taxes.

Let's see. *Before taxes and before wages and salaries*, the steel industry in 1951 earned $55.82 per ton of ingots produced. Silly, isn't it?

Sequence of Events in the Steel Case

Nov. 15-16: United Steelworkers of America-CIO formulates 22 demands at Atlantic City convention.

Nov. 27: Negotiations with the six largest steel companies start.

Dec. 22: Case referred to Wage Stabilization Board.

Dec. 31: Strike scheduled to begin at 12:01 Jan. 1 postponed until a union meeting.

Jan. 4: Union meeting defers strike date until Feb. 23.

Jan. 10-12: WSB's six-man panel holds hearings on case in Washington.

Feb. 1-16: Hearings resumed in New York.

Feb. 22: Steelworkers postpone strike until Mar. 23.

Mar. 13: Panel reports to WSB.

Mar. 15: WSB asks steel operations and negotiations to continue.

Mar. 17: Strike again postponed, until Apr. 8.

Mar. 19: Through industry members of WSB, steel companies offer union 13.7 cents an hour. That, like an earlier offer of 9 cents made through the same channels, was turned down.

Mar. 20: WSB reports on recommendations for settlement—30 cents an hour and benefit in wage hikes, the union shop and other fringe issues.

Apr. 3: Industry offers union 16 cents an hour. The offer was refused.

Apr. 8: The President orders seizure of the steel mills, just as most plants are nearly closed down.

Apr. 9: Steel companies' request for a temporary injunction of the seizure order is refused, and steelmaking operations resume.

president speaking for all the steel companies over a national radio and television hookup April 9. Mr. Randall denounced the President for "shocking distortions of fact."

"He has seized the steel plants of the nation, the private property of one million people, most of whom now hear the sound of my voice. This he has done without the slightest shadow of legal right.

"No law passed by the Congress gave him this power.

"When he asked the Congress for power to seize private property they said no. They gave him instead the Taft-Hartley act which he now spurns, and the power which they denied him he now has seized.

"For whom has he done this? Let no American be misled. This evil deed, without precedent in American history, discharges a political debt to the C. I. O. Phil Murray, now gives Harry S. Truman a receipt marked, 'paid in full' . . . .

"Who were the actors in this corrupt political deal? The so-called public members of the Wage Stabilization Board, public in name only, for Harry Truman knew in advance that they would not let Phil Murray down. Nor did they.

"In the name of stabilization they gave him twice as much as he had ever secured by collective bargaining before stabilization had been attempted.

"In the face of that simple but amazing fact, how could Harry S. Truman have stood here last night and calmly stated that the Wage Board's recommendations were 'fair and reasonable,' and 'in accord with sound stabilization policies?' Only he and Phil Murray thought that.

"The industry members of that board were aghast and declared in a public statement that the proposals of the board had been used 'as an instrument of union appeasement . . . .'

"And, heartsick as many Americans were last night at what their President said, they were pained also at what he did not say. He was purporting to tell the facts, yet he withheld from the public one significant fact. He made no mention of the closed shop. He dealt with money, but omitted principle.

"Actually this order of the board establishes compulsory unionism throughout the steel industry, and the president now asserts that he has the power to put that into effect by force. Our Constitution, which was adopted to protect freedom, becomes in his hands an instrument to destroy that freedom.

"Has liberty sunk so low in Harry Truman's scale of values that he no longer thinks it worth mentioning? Or should he in all candor have taken the opportunity last night, talking as he was to every fireside in America, to make it clear whether or not he had seized the steel plants in order to compel workers to join a union against their will. . . .

"But for downright distortion of fact, Harry Truman was at his magnificent best when he talked of profits in the steel industry . . . ."

"I could not understand his arithmetic. Struggle as I will, I cannot get the answer he did when I divide our tons of steel produced into business as he did . . . He tossed off vast figures of profits without telling the American people that he meant profits before taxes. He said, for example, 'the steel industry makes $19.50 of profit on a ton of steel,' and neglected to say that he takes at least two-thirds of that away in taxes.

"The truth is that in terms of net profit, by which I mean the money the company has left after all costs are paid, the steel companies made—per ton—less than one-third of the $19.50 that the president talked about . . . .

"The actual cost to the steel companies of the package recommended by the Wage Board is 30 cents per man hour. But even this is only half of the ultimate cost. When steel wages go up, the cost of things that steel companies buy goes up in the same degree . . . .

"That makes the full cost $12 per ton of steel.

"With a wave of his hand, the president tossed this fantastic wage increase aside by saying the steelworkers would thus merely be catching up with workers in other industries.

"Actually it is the steel industry itself that has been in the forefront of increasing industrial wages. Since Korea the cost of living has gone up 11 per cent, while the earnings of steelworkers have gone up 13½ per cent. Does this mean that the steelworkers have been unfairly treated?

"I should feel derelict in my own duty as a citizen if I did not to-

night call upon Americans everywhere to take up the challenge the president threw down.

"A sad chapter has been written in American history, which must be erased."

Average Steel Stocks

Most users have 3-4 weeks' supply. Small firms and those who use plates, bars are worst off

STEEL USERS, on the average, have three to four weeks' supply of the metal.

Below the Limit—Legally, steel users may have 45-day stocks of most types of steel. On the basis of a survey by STEEL, only one-third of the steel consumers have the limit on hand. About one-sixth of the companies have less than a week's supply. In the worst position are small companies of all types and any sized firm that uses plates or bars. In the best position are medium and large companies whose primary needs are for sheet and strip.

The auto assemblers, biggest users of sheet and strip, have about 30 days' supplies of those products on hand. The high-priority machine tool industry has three to four weeks' stocks of the steel it uses, but in any event it would be about the last to shut down for lack of steel because of its preference position. Most makers of heating equipment have 30 days of steel. Appliance makers are not quite as well fixed. Many manufacturers of industrial fasteners find themselves in an even more vulnerable position. Some have only a few days' inventories.

Shake-out—While a strike has been threatened ever since the beginning of the year, ferrous inventories generally have declined since then. Several factors account for that: Uncertainties about civilian demand, the fear of defense contract cancellations, the belief common until early in March that a strike was possible but not probable, a shortage of cash caused by the high income tax payments due Mar. 15 and the idea that easing steel supplies would not necessitate high inventories.

A 45-day inventory for many companies is larger than normal. Small firms especially can not always afford such stocks.

The Challenge of the Day

Is Steel Management Free To Manage?

That's a basic issue in the steel case which has been largely overlooked because of the hubbub about money and because of the complexity of the matter

GENERALLY overlooked in the hubbub over wage, union shop and seizure questions in the steel wage case are a group of issues that easily may be the most important ones of all.

They are the "who's going to run the business" issues. More formally they are called contract issues. They are complex. And because they are complex, they have received little attention.

Boring In—They represent a challenge by the union of management's right to exercise its normal function to make the maximum effective use of manpower, machines and materials. If the union challenge should succeed, the cost to industry might be much greater than the amount involved in the wage issues.

Even Nathan P. Feinsinger, chairman of the Wage Stabilization Board, recognizes this: "A constructive solution of such problems may, for the employers, more than offset the cost of the wage increase. Conversely, an improper solution may multiply that cost."

The Problem—The challenge to management's right to manage arises principally in proposals by the union to change clauses in the contracts relating to incentives, job structure, management, seniority and local working conditions.

Here are some examples:

The present management clause in the U. S. Steel contract reads: "The company retains the exclusive rights to manage the business and plants and to direct the working forces." The union proposes to delete the word "rights" and substitute the phrase: "Management has the responsibility . . ." Effect of this change would be to deny that the company has any inherent rights but has only those rights that may be given it in the collective bargaining agreement.

In the rate of pay section of the contracts the union proposes to expressly bar management from changing or terminating any job unless technological changes justify the action or unless it obtains the union's consent.

Fair Day's Pay—The challenge to management's right to manage has been developing over a number of years. Near the end of World War II, the steel companies and the union embarked on a program to eliminate inequities in rates of pay. Joint committees worked for three years to establish a job classification system to give effect to inequity elimination.

Early in 1947, the joint effort resulted in the present job classification system in which 32 classes of jobs were established and standard

hourly rates of pay were established to cover each of those classifications.

Where workers had been receiving less than the new standard hourly rate, they were raised to the new rate and also were given retroactive pay back to 1944.

Where workers were receiving more than the new standard hourly rate, they continued to receive the higher rates.

Fair Day's Work—At the same time the companies argued that such a program had two sides, i.e. a fair day's pay for a fair day's work. They proposed the development of performance standards for a fair day's work. Such a yardstick was agreed upon. It was this: A normal pace of work is equivalent to a man walking, without load, on a smooth level surface at a rate of three miles an hour.

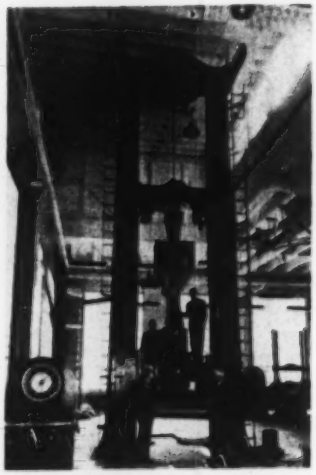
Using this as a bench mark standard, the companies developed standards of performance for many types of jobs.

Union Loses Interest—The union was enthusiastic for the development of standards for a fair day's pay. They developed less enthusiasm for standards for a fair day's work.

Now through a series of contract changes, the union proposes to retain the fair day's pay half of the inequity program and discard the fair day's work half of the bargain.

The union further proposes to prevent the companies from establishing performance standards for nonincentive jobs. This would mean that any worker on a standard hourly rate could produce at the rate he wanted to without regard for the capacity of his tools. If he operates a machine capable of producing eight units an hour, he could, under the union proposal, produce only one unit an hour, or one unit a day, at his discretion. Management could not obtain from its equipment the production that was built into it.

Altogether, the union propositions would combine to invade the field of management, freeze the existing structure of jobs, put a lid over the current level of each employee's performance and permit no improvements in operations except as the union gives approval.



Co-operation Put to Test

Purdue University and Baldwin-Lima-Hamilton Corp. co-operated on detailed specifications for this 600,000-pound Baldwin-Tate-Emery Universal testing machine which dominates the structures laboratory at the University. Capable of holding loads up to 100,000 pounds, machine clearance is 22 feet vertically, 6 feet between columns and 58 feet in length

Handcuffs on Management — Steel management men believe these issues may be far more important than the wage issues in the present case. Without freedom to manage, to use ingenuity, to get maximum use from available manpower, equipment and materials, they wonder how they will be able to pay the higher wages demanded and keep prices at a level at which their product can be sold in adequate quantities.

Costs Hike for Steelmakers

Householders and iron and steel makers have one thing, at least, in common—rising costs.

Cost of ten representative raw materials and construction items, used by the iron and steel industry, increased an average of 142 per cent from 1939 to 1951 says the American Iron and Steel Institute. Among the raw materials that more than doubled in price during this period were: Scrap, fuel oil, zinc, tin, ferro-manganese, silica brick and coke. Average hourly payments to iron and steel wage earners, according to Bureau of Labor Statistics data, increased 123 per cent in that 12 year period.

At the same time, average increase in sales prices of iron and steel was 94 per cent and the consumer's cost of living increased 90 per cent according to Bureau of Labor Statistics information.

Fast Write-offs Go Basic

Accelerated amortization aims at productive base of economy, needed expansion for defense

ACCELERATED tax amortization continues on basic programs in the defense effort and the productive base of the economy. DPA points this out in an industry-by-industry summary of the facilities expansion program as of Feb. 25, 1952.

Over Half Basic—The basic materials, including iron and steel, chemicals, petroleum, nonferrous metals and nonferrous mining, pulp and paper, iron ore mining and coal and coke account for 53.3 per cent of the total dollar volume of certificates approved by DPA. If transportation and power are added, the total percentage accounted for is 80.2 per cent.

Four recipients of the biggest certificates as of Feb. 25: Steel works and rolling mills with $1.47 billion approved for rapid write-off; railroads with $1.35 billion approved; petroleum refiners with $610 million approved; and electric light and power firms with $530 million approved.

Nod for Titanium—Titanium ore people received the biggest pat on the back percentagewise; 90 per cent of the $15 million asked was approved for rapid write-off. Percentages of sought amounts O.K.'d ranged down to 8.6 for merchant wholesalers, with an average in the 40-60 per cent range.

As of Feb. 25, DPA had approved 7188 applications for certificates of necessity for rapid write-off. However, 6196 applications were still pending. Largest was the electric light and power group with $1.5 billion in the wishing well.

Last week, DPA approved 25 electric power projects which will add nearly 1.5 million kw to the

nation's power supply. They represent $247 million of the $1.5 billion pending, and brings to $777 million the total approved for the power industry. Firms other than electric are getting attention. Among them last week was General Motors Corp., Arlington, Tex., aircraft plant with $18 million approved for write-off at 40 per cent and a number of pipeline firms allowed to write off at 25 per cent.

A-C Builds at La Porte Plant

Allis-Chalmers Mfg. Co. will start a $3 million building project soon at its La Porte, Ind., tractor division. The manufacturing and storage building will add 210,000 square feet to present facilities.

In addition, new space will be built in the boiler house for a fourth boiler with a capacity of 60,000 pounds per hour. The expansion is needed in connection with production of the Army M-8E2 cargo tractor.

Should Graphite Controls End?

Continued allocation of carbon electrodes is believed necessary, the Artificial Graphite Producers Industry Committee told NPA, but it could not agree on continued allocation of artificial graphite.

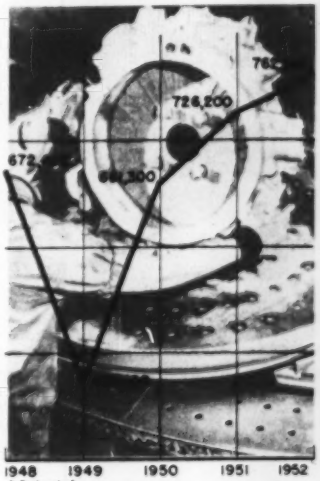
An increased supply of artificial graphite during the first two quarters of 1952 points toward removal of allocations, in the opinion of some committee members, but others feel that consideration of 1952 and 1953 figures indicates that supply and requirements should be practically in balance. This lack of a working surplus could lead to shortages of individual sizes.

Ferrochromium Supply Better

Chromite imported this year will be 200,000 tons more than in 1951, the Ferrochromium Producers Industry Advisory Committee advises NPA. An estimated total of 890,000 tons of chromite suitable for metallurgical use should be imported, depending somewhat on the condition of transportation in some major producing countries.

Inventories of ferrochromium have been increasing since last November and now average about six weeks supply.

Nonferrous Castings Shipments*
(Other than die castings)
In Net Tons



* Estimated
STEEL's figures are based on Census Bureau data.

Better Cast for Nonferrous

Soft spots in the nonferrous castings industry can be lessened with available materials

NONFERROUS foundrymen, no longer hampered by lack of materials, see the chance for a banner year in 1952.

Currently the spotty conditions in the nonferrous foundry industry reflect greatly reduced civilian goods production with slow defense business. No one type of foundry is free from both boom and bust conditions.

Big Boost—Magnesium casters are the best off. Increase in use of magnesium castings in military aircraft enabled shipments in 1951 to double the 1950 total. Outlook is for another boost in output this year, with a trend toward heavier castings. Even the higher cost of magnesium castings hasn't stopped attempts to use them in bigger civilian applications—as the large top wheel for the clutch on Hamilton presses, for example. Holding industry back from greater use of magnesium is uncertainty as to availability of the metal in the future.

Aluminum castings have not been as hard hit as bronze and brass, mostly due to military aircraft orders. With the aircraft program continuing to rise, aluminum foundries expect to go along with it. They could easily handle more orders from their civilian customers without hurting the defense work now on the books, however.

Tantalizing — Brass and bronze foundries are really hard hit by the half-and-half economy. Their end of the defense program has been slow in developing and they are forced to watch civilian orders go by the board because the civilian customer can't get materials to finish his product even though the foundry could easily supply him with castings.

Smaller shops would benefit most by an increase in civilian goods output as they have been doing relatively less defense work than the big shops. Reason: Larger shops are as a rule better equipped to provide quality control required for defense work.

Ready to Go—About a 10 per cent increase above over-all 1951 output is in prospect for nonferrous casters, except die. (For die casting outlook see STEEL, Apr. 7, p. 85.) Even though the defense program may not step-up greatly, any increase in civilian product ordering will immediately be translated in production as more than enough of all materials, including copper, is available. That wasn't true throughout last year.

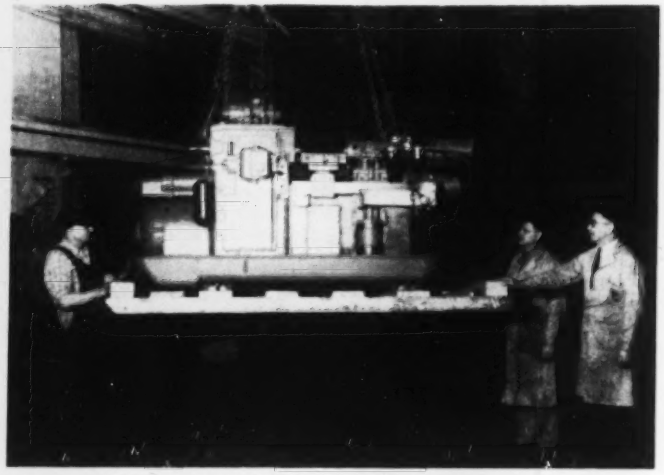
TV, Radio Supplies Improve

The materials supply outlook for the radio and television industry is good, but a general shortage of senior engineers and other highly skilled technicians still remains a serious problem.

Steel, brass mill, copper wire mill and aluminum allotments will be up sufficiently in the third quarter to meet heavier civilian-type production demands, but nickel-bearing steel, copper and selenium will continue in short supply.

The industry needs 1500 more qualified engineers as well as process engineers, testers and quality-control workers.

Civilian requirements for receiving tubes in 1952 will be about 310 million compared with 325 million in 1951. This includes between 5.5 and 6 million television tubes and over 600 other types.



Machine Tool with a Southern Accent

Gisholt Machine Co., Madison, Wis., tapped a relatively new area for machine tool building when it subcontracted out the manufacture of No. 12 hydraulic lathes to the Continental Gin Co., Birmingham. The tools are built from basic design to complete product before being shipped to Gisholt for final testing. Officials at the Madison plant inspect the first Continental-built machine

Aircraft Contracts Are Expected To Soar This Year

WATCH the aircraft industry for more subcontracting opportunities in the months ahead. Nearly half of the nation's military budget is earmarked for plane production.

Thomas Wolfe, president of Pacific Airmotive Corp., predicts that the aircraft industry will become the nation's largest manufacturing field by yearend. And procurement officers of the armed forces are insisting on more and more on subcontracting by prime contractors. A special panel of "subcontracting experts" reviews all contracts awarded by the Navy Bureau of Aeronautics.

Awarded—Indicative of the emphasis on increased aircraft production is the news of two big new contracts. Ryan Aeronautical Co., San Diego, Calif., will build aft fuselage sections, refueling pods, cargo doors and floor beams for the Air Force's Boeing C-97 Stratofreighter. The Stratofreighter is a combination cargo plane and flying tanker.

Jet pods, or power packages, for a new B-52 Stratofortress will be built by Rohr Aircraft Corp. The Stratofortress, also produced by Boeing, is still shrouded in secrecy, and the airforce hasn't yet revealed figures as to its size, weight, speed or range.

See the table at the bottom of the page for selected metalworking contracts awarded by the government in excess of $100,000 in value.

PRODUCT	CONTRACTOR
Milling Machines	Cincinnati Milling Machine Co., Cincinnati
Paper Fastening Machines	Speed Products Inc., Long Island City, N. Y.
Shells, HE 1, M97	Harvey Machine Co. Inc., Torrance, Calif.
Shells, HE, M43A1B1	Kennedy-Van Saun Mfg. & Engineering Co., Danville, Pa.
Components for M114 Bombs	Kold-Hold Mfg. Co., Lansing, Mich.
Boosters	Scripto Inc., Atlanta
Metal Parts for Boosters	Clary Multiplier Corp., San Gabriel, Calif.
Parts for Primers	King-Seely Corp., Ann Arbor, Mich.
Cartridge Cases	International Silver Co., Meriden, Conn.
Cups, cal. .30	Scovill Mfg. Co., Waterbury, Conn.
	Chase Brass & Copper Co. Inc., Waterbury, Conn.
Tank Automotive Parts	Continental Aviation & Engineering Corp., Muskegon, Mich.
Motor Vehicle Parts	Biederman Motors Co., Cincinnati
	Northwestern Auto Parts Co., Minneapolis
	Federal Motor Truck Co., Detroit
	Kenworth Motor Truck Corp., Seattle
Parts for Diesel Engines	General Motors Corp., Detroit
Parts for Gasoline Engines	Outboard, Marine & Mfg. Co., Waukegan, Ill.
Parts for Turbines	General Electric Co., Schenectady, N. Y.
Valves	Crane Co., Chicago
Parts for Gyro Compasses	Arma Corp., Brooklyn, N. Y.
Refrigeration Equipment	Carrier Corp., Syracuse, N. Y.
Aircraft Parts	Bendix Products Div., Bendix Aviation Corp., Detroit
Bearings	S K F Industries Inc., Philadelphia
Actuators	Lear Inc., Grand Rapids, Mich.
Parts for Cranes	Bay City Shovels Inc., Bay City, Mich.
Parts for Materials Handling Equipment	Ross Carrier Co., Benton Harbor Mich.
Steel Electrodes	Metal & Thermit Corp., New York

Railroads Plead for Clear Track

Railroad freight car and locomotive manufacturers are having trouble getting enough material for new equipment, and the rail roads are having trouble getting enough money to buy what is produced.

Pointing to shortages of bars, plates and structural steels, the manufacturers say NPA authorizes the production of a certain number of units but cannot assure delivery of steel sufficient to build them. They also say that notification of quarterly steel allotments comes too late to place mill orders, forcing them to pay premium prices for material if it can be purchased at all.

Long delays in adjustment of railroad rates to changing costs of operation and ultimate inadequate authorization under existing laws have made it impossible for rail carriers to purchase all the cars and other facilities needed to improve transportation, Fred G. Gurley, president of Atchison, Topeka & Santa Fe Railway told the Senate Committee on Interstate and Foreign Commerce.

Heavy Shipment Losses Cited

Loss and damage to goods in shipment of over $100 million each year is due to negligent packing, marking and handling of products on their way from manufacturer to consumer, says Henry H. Pratt, general traffic manager of Crucible Steel Co. of America.

Citing unsatisfactory progress in meeting this problem thus far, Mr. Pratt recommends mutual understanding of shippers' and carriers' problems, development of more information within each industry concerning shipping problems and methods of solving them and better training and supervision of employees.

CHECKLIST ON CONTROLS

GOVERNMENT control orders are digested or listed each week in this "Checklist on Controls." For complete copies of NPA orders, write to NPA Distribution Section, First Basement, New GAO Bldg., Washington 25. For copies of OPS orders, contact nearest OPS district or regional office. For copies of OPS news releases, write David S. Phillips, director, OPS Administrative Services Division, Temporary E Bldg., Washington 25.

Materials Orders

STEEL PLATES — Direction 5 to Order M-1 prohibits the production on and after July 1, 1952, of carbon steel plate 3/4 inch or less in thickness on wide plate mills (those with a width of 160 inches or more). Direction 5 was issued Apr. 3, 1952, and is designed to conserve the productive capacity of mills capable of producing heavy and thick plates. The limitation does not apply to stainless or other alloy steel, armor plate, plate for pipes, plate circles for flanged and dished heads, or conversion steel plate.

TIN—Amendment of Apr. 9, 1952, of NPA Order M-8 is to strengthen effectiveness of limitations on small users of tin. The amendment makes it clear that small users are allowed only 90 per cent of the amount of pig tin they consumed during an average quarter in their base period. The amendment was effective Apr. 9.

MACHINE TOOLS—NPA Order M-104 issued Apr. 9, 1952, and made effective that date, limits the preparation for painting and the application of paint on new metalworking machines to the minimum requirements for adequate protective finishes.

Controlled Materials Plan

STEEL EMBARGO—Direction 10 to CMP Regulation 1 shut off the flow of steel to exporters and to manufacturers of consumer durable goods, including automobiles, Apr. 7, 1952. The freeze, applied to all steel products on hand in any warehouse or mill, and was intended to reserve existing stocks for high-priority defense needs during the steel strike threat period. Direction 10A to CMP Reg. 1 removed the freeze from mill shipments. Direction 10A was issued Apr. 8 and made effective that date.

NPA Regulation

INVENTORIES—Amendment of Apr. 2, 1952, of NPA Regulation 1 removes 25 chemicals from inventory control, raises inventory limitations on four commodities from 45 to 60 days, and places 14 other items under control of CMP Regulation 2. The four items on which inventory limitations were raised to 60 days are pig iron, gray iron castings, malleable iron castings, and rough steel forgings. The 14 items transferred to control of CMP Reg. 2 are iron and steel products which recently became controlled materials. The amendment was effective Apr. 2.

Price Regulations

TEMPERATURE CONTROLS — Supplementary Regulation 25 to Ceiling Price Regulation 22 gives manufacturers of domestic and commercial automatic temperature controls an industry-wide factor fixing their ceiling prices at 3.9 per cent over the ceilings which they established under the General Ceiling Price Regulation. SR 25 was effective Apr. 7, 1952.

ZINC SCRAP—Amendment 2 to Ceiling Price Regulation 43 and Amendment 2 to Ceiling Price Regulation 53 permit computation of weight of zinc scrap and battery lead scrap at point of shipment, rather than at buyer's receiving point, on sales made by the U. S. government. The amendments were effective Apr. 9, 1952.

DECORATIVE LIGHTS — Supplementary Regulation 96 to the General Ceiling Price Regulation, Amendment 45 to Ceiling Price Regulation 22, and Amendment 9 to Supplementary Regulation 12 to CPR 22 permits manufacturers of Christmas tree light sets to use ceiling prices based upon price lists issued by them before Jan. 25, 1951, whether or not they made actual deliveries at these prices during this period. The lists must have been communicated to the trade or a substantial number of customers in the manufacturer's customary way. Effective date of the changes to the price regulations was Apr. 12, 1952.

GALVANIZED PRODUCTS — Amendment 1 of Supplementary Regulation 76 to the General Ceiling Price Regulation permits adjustment of ceiling prices on galvanized iron and steel products by producers who were not parties to the steel industry's voluntary agreement with the Economic Stabilization Agency. Those who were parties to that agreement had been permitted to raise their prices on galvanized products to reflect increases in zinc prices. Amendment 1 is effective Apr. 14, 1952.

Welding Conference Apr. 16-18

Quality control keynotes the opening session of the Third Conference on Electric Welding at Rackham Memorial Building, Detroit, April 16-18. Sponsored by American Institute of Electrical Engineers and the American Welding Society, the conference will feature two sessions at which the newest welding equipment and techniques will be shown.

ASLE Elects Merchant President

The American Society of Lubrication Engineers, in their seventh annual convention at Cleveland, elected Dr. M. Eugene Merchant, Cincinnati Milling Machine Co., as their president. A record registration of 1220 persons saw 33 displays showing oils, greases, metering devices, regulators, valves and filters in the fifth annual convention exhibition.

Howe Accepts NPA Post

Ralph S. Howe, executive vice president, New Britain Machine Co., New Britain, Conn., becomes director of National Production Authority's Metalworking Equipment Division on Apr. 15. He succeeds Swan Bergstrom who will rejoin Cincinnati Milling Machine Co.

Appointments in Washington

Clyde Llewelyn, vice president of Bliss & Laughlin Inc., was appointed chief, Cold Finished Steel Bar Section, Iron & Steel Division, National Production Authority.

Robert W. Scott, of the Hyster Co., was appointed chief, Materials Handling Equipment Branch, General Industrial Equipment Division, National Production Authority.

Carl Duckwitz, of the Clark Equipment Co., was appointed chief, Industrial Truck Section, General Industrial Equipment Division, National Production Authority.

C. G. Hawley, of the Jeffrey Mfg. Co., was appointed chief, Conveyer Section, Industrial Equipment Division, National Production Authority.

Fred R. Cooper, of the International Harvester Co., was appointed chief, Automotive Branch, Industrial & Manufactured Goods Division, Office of Price Stabilization.

J. V. O'Conner, of C. G. Hussey & Co., was appointed chief of the Brass Mill Section, Copper Division, National Production Authority. He succeeds David T. Marvel, recently named assistant deputy administrator, Metals & Minerals Bureau, National Production Authority.

Raymond J. Bros. president of the William Bros. Boiler & Mfg. Co., was appointed industry vice chairman, Small Business Regional Advisory Board for Minnesota, North Dakota, South Dakota and Montana.

Max Noble, assistant sales manager of Fresh'nd-Aire Co., a division of Cory Corp., has accepted a post with the Electric Fan Section, Consumer Durable Goods Division, National Production Authority.

Windows of Washington

By E. C. KREUTZBERG Washington Editor

The work of industry men in defense agencies is not over . . . Large segments of industry want to see controls continued for some time yet . . . Moisture meters: Weapons against rust

INDUSTRY MEN—regardless of approaching easement in materials supplies—will continue to serve in the defense agencies.

They won't be so busy as they were a few weeks ago when telephone calls and airmail letters kept them on a treadmill. There are fewer staff meetings, the time-consuming, frequent spells that ate into their day in Washington. Even now some industry men find time hanging heavy on them. But that doesn't mean their work is done.

Ready for Action—CMP is functioning well, sure; practically all orders needed to spur defense activity are formulated. But controls machinery won't be junked by any manner or means. Manly Fleischmann makes that clear. Coming decontrols and the development of a special priority system to take care of the military and Atomic Energy Commission requirements are the reasons. Mr. Fleischmann says the whole control system, particularly CMP, must be kept intact to meet emergencies.

Then there are always the problems that require immediate attention. At the moment problems in copper, certain machine tools and other industrial equipment, heavy castings and forgings, heavy presses, certain chemicals and nickel pop up.

Continuing Need—NPA, in presenting its budget to the House Appropriations Committee, indicates a 10 to 15 per cent reduction in personnel can be expected in the first half of '53. And part of the expected reduction may occur in the ranks of industry men. But large numbers of them will be needed indefinitely.

Decontrol? No. No . . .

Opposition to DPA and NPA's plans to decontrol materials on a wide scale—surprisingly enough—comes from large segments of the affected industries. They don't like the idea of controls ending in the fourth quarter or, at the latest, by the first quarter of '53.

They've made their feelings clear to various industry advisory committees in one way or another. Why? They like CMP. Experience has shown them that their CMP tickets are as good as gold when it comes to getting materials. A by-product of the system to many: They don't have to tie up an undue proportion of working capital in inventory. Too, they like the way controls puts everybody on the same basis as to supplies on hand. Some would like to see an indefinite continuation of the situation.

Some automakers, for instance, don't want to see the end just yet of the present limit on unit production of the different producers. At least they don't want a change until there is no danger that big fellows won't benefit disproportionately compared with their smaller competitors.

But preliminary moves to end controls continue. A majority in Congress seems eager to end them just as soon as they're no longer necessary.

Perilous Profits

THE STEEL INDUSTRY isn't the only one with profits in a perilous predicament. Mundy I. Peale, president of Republic Aviation Corp., says contracts let this year allow the aircraft industry a 2.24 per cent margin "so slender it threatens maintenance of U.S. air superiority." He believes it is false economy to allow the industry to fall off as it did in World War II and then expect it to be ready whenever the bugle blows.

Moisture Meters . . .

Army Ordnance, continuing its attack against rust, uncovered a new weapon in the age-old struggle. Moisture meters, developed by Minneapolis-Honeywell Regulator Co., Minneapolis, and American Instrument Co., Silver Spring, Md., are the latest additions to the growing arsenal.

The meters consist of two parts: One, a moisture-sensing element about the size of a cigar lighter (it's inserted into a hole in the side of a package), the other, an electric meter (plugged into the protruding end of the moisture-sensing part). Readings are taken from a dial needle that points to a green "safe" area or to a red "unsafe" area. Moisture accumulations can be spotted before damage actually occurs and can save "millions," say Ordnance officers. Development work is still going on to make the instruments even more sensitive.

Moisture meters plug a big gap in the defense against rust. Most rust-proof packages(for guns, artillery, automotive replacement parts) are used to wrap items—along with a desiccant—in an air-tight parcel. Most packages serve well; a small percentage prove leaky. Formation of rust, since it otherwise couldn't be detected without opening and inspecting, runs into the big money for Ordnance. It figures the cost of the meters (under $5 each) will be well worth the savings.

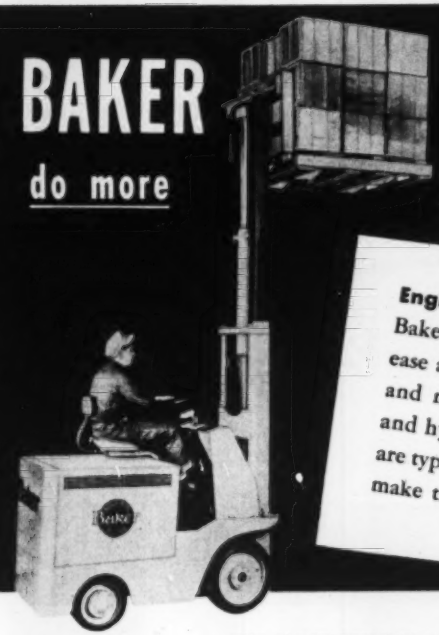
Heavy Casters Urge Federal Aid

If heavy castings facilities for defense production are to be expanded, it must be with government funds, 31 representatives of the industry told National Production Authority. NPA officials said that defense requirements will necessitate more capacity than is now available in the industry, which already has a backlog of 1 million tons.

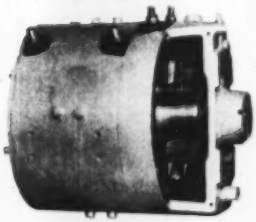
Some producers have expanded to some extent, but others claim they cannot increase production because of lack of space or lack of desire to use their own funds. The industry also indicated that scheduling of orders should be left to the individual foundries except in the case of the limited number who produce the largest castings.

BAKER FORK TRUCKS

do more work per dollar invested



Engineering genius has developed the new Baker line of Fork Trucks for maximum utility, ease and economy of operation, low first cost and minimum maintenance. The electrical and hydraulic components illustrated below are typical of the many built-in features which make this possible.



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1. Baker designed and built for severe industrial truck service.
2. Cost less to operate because of higher efficiency.
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1. Low-pressure hydraulic system—less subject to oil seepage than high pressure systems.
2. Danger of dropping heavy loads effectively reduced.
3. Operator-controlled metering valves give positive control of lifting and lowering.
4. Oil by-passed to reservoir at travel limits for greater safety.
5. Efficient Baker motor, designed for this function, drives the hydraulic pump.
6. Gear-type pump for greatest efficiency.

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3. In decelerating, truck acts as prime mover, motor as generator, to achieve *Dynamic Braking*.
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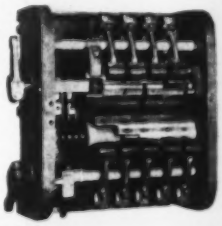
5. Advancing through five steps necessary in accelerating to top speed.
6. Plugging impossible when changing travel direction.
7. Speed selection by foot accelerator for operator convenience.
8. Travel direction selected by lever on dash.



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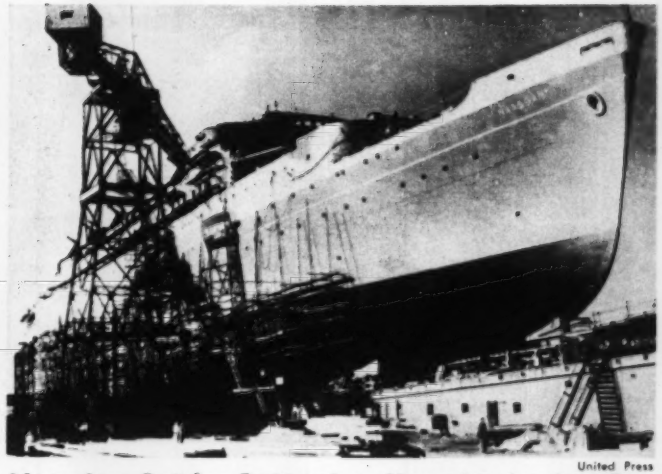


United Press

Maasdam Set for Rotterdam-New Amsterdam Run

The 15,000-ton Dutch passenger liner *Maasdam* was launched at the Wilton Fyenoord Yards in Schiedam, Netherlands, on Apr. 5. Scheduled for her maiden voyage from Rotterdam to New York in September, the ship will carry 836 tourist-class passengers and 39 first-class berths. It is entirely air conditioned

Russia Shifts Its Steelmaking Centers

A quick look under the ruffles of the Iron Curtain shows an increase in alloy steel production and a movement to locate new plants deep inside Russia

HERE'S a peek at steelmaking behind the Iron Curtain.

Two currents in the Soviet Union's expansion program for its iron and steel industry are the movement of big plants to the east, toward the Ural Mountains, and a build-up of special alloy steelmaking capacity. This glance behind the Iron Curtain, from reports of H. Hellman, a London journalist who represents several West German newspapers, indicates the Russians are still working toward those goals.

For Defense and Offense—Movement to the east, away from Central Europe and toward the Urals, stems from the experience of the Russians in World War II when the invading German armies destroyed as much as 60 per cent of Russia's steelmaking capacity, then concentrated in west Russia.

The main group of plants making special high-performance steels works under a separate department, the "Glavspetsstal," of the Ministry of Metallurgy. Plants under exclusive control of the Glavspetsstal (Chief Administration for Special Steels) in southern European Soviet Russia include: The Zaporoshstroi Trust, which produces thin sheet steel for motor vehicles, hot and cold-rolled steel, ball and roller-bearing steel, magnesium steel, and low-alloy construction steel. A special section of the plant, called "Zis," makes only machine tool steel for high-velocity cutting. The Ilyitch steel works, in Mariupol, which turns out armour plate, armoured vehicle undercarriages, heavy sheets, ordnance steels, and steel for transportation, engineering and shipbuilding. The Krasny Oktiabr (Red October) steel works, in Stalingrad, makes all types of motor vehicle steels, and steels for shell cases, armour plate and undercarriages for armoured vehicles.

One of the Biggest — Plants, under the jurisdiction of the Glavspetsstal in central European Russion include: One of the biggest plants in the Soviet Union, the Elektrostal, in the city of Elektrostal near Moscow, which produces all types of alloy steel, including alloys for cutting tools. The Serp i Molot (Hammer and Sickle steel works, in Moscow, which turns out high and low grade construction steel.

Plants of the Glavspetsstal in the Urals include: The Zlatoust steel works, specializes in machine tool steels, and steel for rifle and gun manufacture. The Verkhne Issetsky steel works, at Verkhne Issetsk, produces steel mainly for the manufacture of electrical generators and transformers. The Serovsky steel works, in the city of Serov (northern Ural), makes steel for military equipment.

Partial Producers — There are also a number of plants under the administration of the Ministry of Metallurgy which produce high-performance steel as only part of their output. These include the Kirovsky works in Leningrad; the Lenin works in Dniepropetrovsk, which makes thin-walled steel tubes for use in aircraft and the Karl Liebknecht works in Nizhnedniprovsk, whose output includes steel for gun barrels.

Special steels are made by almost all the plants of the steel tubes rolling industry, including the Andreiev works in Taganrog; the Kuibyshev works in Zhdanov; the Vyksunsky works in Tsentrum; the Red Tube works in Moscow and Leningrad; the Yakubovich works in Voroshilovgrad; the Novo-Uralsky tube works in the central Urals and the Southern Tube and Steel Works in Nikopol.

In addition, most large manufacturing firms in Russia have their own steel production and rolling mills. The following rank among the most important of these: The Uralmashstroy, or Ural Machine-building Works, which makes heavy machinery; the Andre Marty shipyards at Nikolaiev; the Kramatorsky engineering works, which has one old and one new plant at Krammash and a branch plant in Elektrostal.

Last, Not Least — Two of the largest plants for making high-performance steels, which were opened during the last war, are the Cheliabinsk Steel Trust, east of the Urals, and the Southern Urals Steel Trust in Novo-Troitsk.

THE TELEPHONE . . . THE INVENTORY CHECK . . . THE INDEX OF MANUFACTURERS

Those are three common tools used by purchasing agents. J. W. Farrell of Mullins Mfg. Corp. confirms a delivery date (left), spot checks his company's supply of steel (center), and hunts for an aluminum die casting producer

Life with Farrell of Mullins Mfg.

Buyers have had a difficult time in the past decade, and their troubles aren't over yet. Here's how one — with a Salem, O., firm—meets his problems

THE SEAT that's been the hottest the longest in industrial offices belongs behind the purchasing agent's desk.

Among the 51,000 metalworking companies, the buyer's job has been unusually difficult because at least some metals and parts made from metals have been constantly hard to get during most of the past decade.

Doing Well—How's the buyer for a metalworking company holding up after ten years of trouble? He's doing remarkably well, judging from James W. Farrell, director of purchases for Mullins Mfg. Corp., Salem, O. His problems may be a little more complex than those of the average purchasing agent, too, for he represents a company bigger than average. It has more than 4000 employees and diverse buying requirements. He heads a staff that last year was responsible for the purchase of $35 million worth of equipment, goods and services.

In 1951 Jim Farrell supervised the purchase of more than 100,000 tons of sheet steel, the most important item from both the tonnage and dollar standpoint that Mullins buys. In the company's purchasing department of 13 people, two men are detailed to watch steel performance, three are stenographers, four in invoice checking and statistical work and four (including Mr. Farrell) actually do purchasing. Sheet steel is such a factor in the Mullins picture because the company is primarily a stamper. It has several defense contracts but thus far they have not affected other operations. Its main activity is production of Youngstown Kitchens steel cabinets, sink units and electric dishwashers for domestic use. It also does job stamping work and turns out washing machine tubs and truck parts.

The Wherewithal—"My primary job for the past decade," says Jim Farrell, "has been to see that production is never halted by shortages. I have not always succeeded."

"Actually, he's done mighty well," says George E. Whitlock, president of the company. "Sure, we've had to slow or halt production occasionally because we ran out of something, but in these times who hasn't done that?"

Definition—Jim Farrell's conception of a purchasing agent's task is "to get what is wanted when it's wanted at most beneficial ultimate cost." The cost element in the job has from necessity been overlooked frequently in the last ten years by purchasing men, but he feels that we're on the threshhold of an era of mountainous labor costs when the good buyer will have to be unusually particular about prices—or perish.

Jim Farrell thinks buying is primarily selling. "A good buyer must get along with people," he says, "and sell his company as a good firm to deal with over the long run." The Mullins official thinks all buyers should have some selling experience. He himself has already done two selling stints in his 40-year business career and is now in this third period of purchasing. "The way it has worked out," he says with a slow smile, "is that I've sold in a buyer's market and bought in a seller's market."

His Day—A business day early this month began for Jim Farrell at 8:40 a.m. in his Salem office. Not all begin that way. About 25 per cent of the time he's out calling on suppliers, often on one of the eight steel companies he deals with. He also frequently stops in first at one of the four Mullins

plants (two in Salem, two in nearby Warren, O.) to look into some expediting problem. About 98 per cent of all expediting at Mullins is handled by production men, but he or someone else in purchasing tackle the 2 per cent that are unusually tough.

On that particular April morning, the director of purchases had a date with Jacques Stanitz, the chief products development and design engineer and a man with whom he consults frequently. This time it was about the redesigning of a part so aluminum die castings can be used. He spent an hour on that, then returned to his office to find a telegram reporting that a steel shipment would be 24 hours delayed. He checked his latest weekly inventory list and saw that the change would not matter too much.

On Top of the News—Next he looked through his mail and glanced quickly at headlines in two business newspapers and a magazine. He does most of his business reading at home. "I don't have time here," he comments, "but I've got to keep on top of the news or I'm lost."

For the rest of the morning, Jim Farrell was occupied with three callers. He sees five or six a day, while some 20 or 25 more are seen by other members of his department—considerably more than just a few months ago. The first represented a Pittsburgh warehouse and offered to sell sheets cut to specifications at only the mill extra. The offer was turned down because Mullins gets little tonnage of sheets from warehouses. The second caller had a clamping device to hold work. He was referred to a production man who would look it over and later report on what he thought of it. The third caller was a man who has been selling Mullins drawing compounds for years.

Teamwork — After lunch Jim Farrell dropped in at Frank Knecht's office. Among other duties, that member of the executive staff keeps track of the controls regulations coming out of Washington. Jim Farrell wanted to know if he could get any more steel strapping. He found that he could. Next, he returned to his desk to polish up a proposal to boost purchases of packaging materials—corrugated cartons and corrugated crates—the second most important thing Mullins buys. Jim Farrell frowns on speculative buying, but his inventories vary considerably over the year according to market conditions and Mullins' operating status. Purchasing proposals are initiated by the purchasing department but must be approved by top management. In the case of the packaging materials, the buyer went to see H. M. Heckathorn, the company's executive vice president.

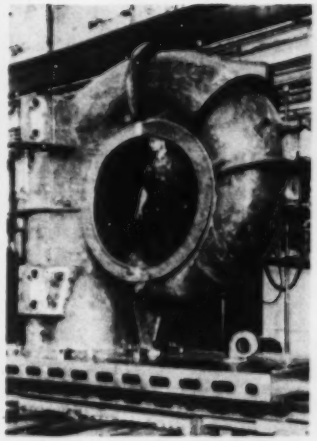
When that discussion was over, he dealt with another caller (from still another warehouse), two phone calls on interoffice matters and one from a manufacturer of trim. A fifth visitor arrived, from a fastener supplier, and the two went over to Jacques Stanitz's office. It was almost four o'clock when he returned to his desk and got a call from the metallurgy department reporting that the silicon content in a steel shipment was this time O.K. (Some difficulties had arisen there the previous week.) A company driver then phoned to report he had picked up the new truck Mullins had just bought and what should he do about the papers with it.

More Help — "Take them into Mr. Wykoff. He knows all about them," Jim Farrell said. H. F. Wykoff is the company's treasurer. "That's what I like about this job," the purchasing agent comments. "You get co-operation. You have to or you flop. A buyer needs help in engineering, accounting, law, production and just about every other phase of a company's business. I get that help. That's why I like this spot—besides, my wife likes it, too. She didn't care for the hours I had to keep when I was selling."

AEC Invites Fission Tacklers

Additional proposals for preliminary studies of privately financed reactors for the production of fissionable materials and power will be considered by the Atomic Energy Commission.

Goal of the studies would be: Determination of engineering feasibility of design, construction and operation of a reactor by private enterprise; examination of the economic and technical aspects of building such a reactor; measure of the research and development work needed before such a reactor project could be undertaken; recommendations to the AEC on what should be the specific role of industry in carrying out such a reactor program.



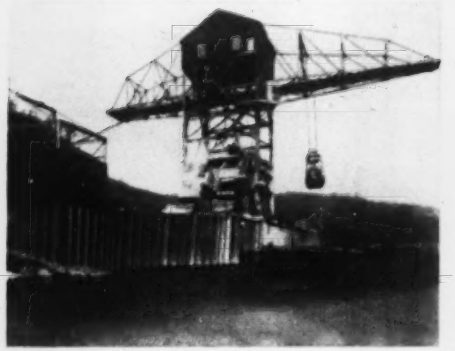
Big Brother—Little Brother

Although they are the same model, the sizes of these two Fairbanks-Morse pumps are as far apart as night and day. The 54-inch gigantic angleflow pump has a top capacity of 80,000 gallons a minute. Its 8-inch brother can handle 800 gallons a minute

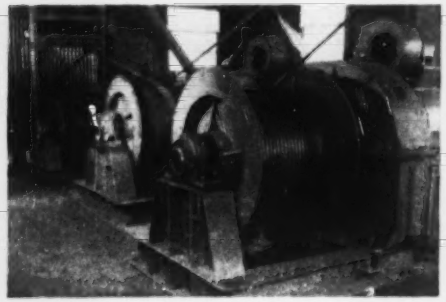
Four such studies are now underway through proposals accepted from private industry in 1951, and they should be completed in the near future. As under these present agreements, all cost on the first phases will be borne by the companies except the time of the AEC and its contractors needed for consultation and information services. The AEC will decide on the disposition of all inventions.

Any new proposals should be received by the Commission before June 1, 1952.

The eight firms in the four original groups are: Monsanto Chemical Co. and its associate, Union Electric Co., both of St. Louis; Detroit Edison Co., Detroit and Dow Chemical Co., Midland, Mich.; Commonwealth Edison Co. and Public Service Co. of Northern Illinois, both of Chicago; and Bechtel Corp. and Pacific Gas and Electric Co., both of San Francisco.



This 720 ton-per-hour Barge Unloader . . . designed, fabricated and erected by Heyl & Patterson . . . was recently put into operation for the Duquesne Slag Co., Pittsburgh, Pa.



The Close Drum and the Hold Drum (right and center), which raise, lower, open and close the bucket, are operated by two 200 H.P. motors. The Trolley Drum (left) is operated by one 100 H.P. motor.

All motions of the Trolley and Bucket are easily controlled by a single operator.

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By H. C. TUTTLE Detroit Editor

Mirrors of Motordom

Cylinder heads for Ford-built Pratt & Whitney aircraft engines are stored prior to machining. Materials handling and packaging problems are getting more attention in the motor capital where they represent 30-60 per cent of final cost

Automotive companies are taking the lead in developing the science of getting the right part to the right place at the right time in the right condition

DETROIT

GETTING THE right part to the right place at the right time in the right condition is every bit as important as manufacturing that part.

The realization that this is so, however, is just beginning to penetrate. Two happenings are evidence. One of these was the American Management Association's National Packaging Conference. The other is the formation of a materials management center at Detroit's Wayne University.

Attention—Both events are attracting the interest and enthusiasm of top-drawer management. Attendance at the AMA show was many times greater than it was right after the war. Organization and fund-raising meetings for the Wayne undertaking have brought out some of the shiniest of industry's brass.

The reason materials handling and packaging are coming into sharper focus as one of the most important problems before management is basic: Cost. It is estimated that between 30 and 60 per cent of the cost of a given manufactured item can be accounted for by these related functions. Men who are studying the problem generally refer to the opportunity for cost cutting in this phase of operations as being the new frontier for industry. Del S. Harder, vice president, manufacturing, Ford Motor Co., guesstimates that $9 billion a year is spent by industry for production labor alone on manhandling materials from place to place.

Big Item—The opportunity for savings in the materials used for packaging is likewise not measured in nickels and dimes. In General Motors Corp., for example, $42 million worth of packaging materials was used last year. The materials handling engineer and the packaging expert are farther down the line in the chain of industrial command than they should be, authorities believe. These jobs deserve equal rank with engineering, manufacturing, research and similar top personnel.

One purpose of the Wayne Materials Management Center, as part of the school of business administration, will be to train men for this profession. The materials manager, as Wayne visualizes him, will be solidly grounded in these nine functions: Procurement, packaging and preservation, layout and equipment development, handling, inventory control, quality control and grading, warehousing and storage, loading, and traffic.

Sponsors—Sponsors of the center are the American Materials Handling Society, the American Society of Mechanical Engineers, the Detroit Board of Commerce, the Society of Industrial Packaging & Materials Handling Engineers, the Materials Handling Institute Inc., and the Michigan Training Council.

The automotive industry is at the front in discovering economies in handling and packaging. The answers it comes up with for its specific problems can frequently be applied by other industries.

Big Handler — General Motors was used as a case study at the AMA Conference. Although no other organization is like GM, and the quantity of materials it handles is almost incomprehensible, this case history contains many suggestions for other companies. As a group its 35 manufacturing divisions last year received more than 42.5 billion pounds of material. Before being used and shipped much of this stuff is handled 30 to 50 times. It supplies over 225,000 different automotive service parts.

Following are some of the handling and packaging methods used by GM for specific items which might be applicable to other manufacturers. The list is, of course, fragmentary.

- Delco radios, formerly packed in individual cartons, now are shipped to carmaking divisions in a corrugated pallet pack, 96 to the package, for a savings for Delco in packaging material and 13 per cent in space, and a saving in unpacking time for the receiver.
- Cadillac uses printed pressure-

(Material in this department is protected by copyright and its use in any form without permission is prohibited)

sensitive tape on unpackaged items such as chassis springs and frame members which gives part and group numbers, also the Cadillac crest for ready identification.

● Factory sealed fibre cans equipped with tear strings for easy opening are used by several divisions. Some of these carry lithographed pictures of the contents.

● Electro-Motive Division packages its armature repair kit, which consists of 2861 pieces, in one unit. It is a 450-pound corrugated pallet box with each part segregated and identified. Only one part number is used for the entire package. It is assembled by Electro-Motive in reverse sequence, so the user finds the parts needed first on top.

● Pontiac Motor converted tire wrapping machinery to wrap long and irregular shape bumpers.

● New Departure uses small glass bottles and a clipboard holder common in the pharmaceutical trade to package aircraft instrument ball bearings.

● Ternstedt Division has adopted flat pallets, consisting of two faces nailed together without runners. Fork truck handling is mandatory. If universally adopted these pallets would save 800,000 cubic feet of space in GM plants.

● GMC packages a six-foot long curved bus windshield in a ribbed corrugated container, specially designed so that the glass is not in contact with its walls. Previous to adoption in 1950 breakage ran to 33 per cent. There has been no breakage since adoption. Several divisions use round and square tubing of various materials which they slice laterally as packages for various length items.

● Diesel Equipment Division seals its oil-filled hydraulic valve lifters with a hot plastic dip before shipping.

● Chevrolet, using an excelsior pad wrap for body quarter panels, turret tops, doors and fenders, eliminates cartons. Shipping weight and space savings in a year are 1,170,000 pounds and 197,000 cubic feet for the body panel and 672,000 pounds and 316,000 cubic feet for the tops.

● Hyatt Bearing packs 3200 pounds of roller bearings in a 41-pound package of corrugated board on a pallet of the same material.

Auto, Truck Output

U. S. and Canada

	1952	1951
January	409,406	645,688
February	467,688	658,918
March	521,855*	802,737
April		680,281
May		695,898
June		653,682
July		522,858
August		571,442
September		505,758
October		558,971
November		480,199
December		402,729
Total		7,179,161
Week Ended	1952	1951
Mar. 8	115,126	180,819
Mar. 15	120,392	182,819
Mar. 22	125,347	174,953
Mar. 29	132,850	184,514
April 5	127,039	158,076
April 12	129,000*	162,839

Sources: Automotive Manufacturers Association, Ward's Automotive Reports. *Preliminary.

● Marine Products ships 19,968 connecting rod bearings weighing 2100 pounds in a corrugated package on a nonreturnable wood pallet; container weight, 80 pounds.

● Semiautomatic methods are used by Buick for packaging low-volume parts. Automaticity is limited to functions not requiring frequent changeover.

● Electro-Motive uses vapor corrosion inhibitor paper in 98 per cent of shipments. A fuel injector, formerly packed in a four-dollar metal container and given a heavy coat of oil to prevent rust, can be shipped in a 29-cent fiber-board carton when vapor corrosion-inhibiting paper is included. Three years use of this package has produced no failures.

● Electro-Motive is experimenting with vapor-corrosion inhibitor in the form of crystals. A metered air gun will spray the right quantity into a package just before it is sealed.

● Buick is experimenting with a plastic coating for sheet-metal body parts to replace paper and padded wrappings now used.

Ford Begins Tube Output

Ford Motor Co. is back in steel tube production. This activity is not associated with its steel rolling operations at the Rouge, but is located at the Mound Road plant north of Detroit where two tube mills are used to make material for axle housings and drive shaft assemblies. Ford last made tubing in 1942 at Hamilton, O.

The tube mills are capable of quick conversion to welded tubing up to 5-inch diameter if required. One of the mills, 175 feet in length, produces tubing at the rate of 105 feet a minute, a speed which Ford engineers claim is unequalled in the industry for light-quality steel. The other, measuring 400 feet long, operates at 75 feet a minute.

Willys Station Wagon Ready

Willys-Overland's 1952 model station wagons go on display today equipped in the deluxe version with the 90-horsepower, six-cylinder "hurricane" engine used in the Aero line. The utility vehicle is graced with new chrome trim molding on the hood and cowl. The tail lights are mounted on the corners, and the rear bumper is of the wrap-around variety, originating at the base of the rear-wheel cutout.

More for Ford?

Whether Ford's big howl in Washington for a larger slice of the quota pie will bring about any redistribution this late in the meal is subject to much speculation around the Motor City. Ford seeks to bump Chrysler Corp. out of the number two spot while rejuggling all quotas so that the big three and Studebaker get more and the other independents less.

It bases its claim to 23.42 per cent of the passenger car output (against its present 21 per cent) on performance in the year ended June 30, 1950. NPA uses 1947-1949 as the base period. Ford charges this period fails to take cognizance of its reorganization and other moves which it believes have changed its competitive standing. The lengthy brief in which Ford submitted its proposal contends that the government's "misregulation" deprives it of $228.6 million in revenue. The NPA truck quota is also under fire. In the current quarter, says Ford, NPA prevents it from making 90,024 passenger cars, 27,792 light trucks, 16,764 mediums, and 3300 heavies. NPA's appeal board will take up the complaint on Apr. 29.

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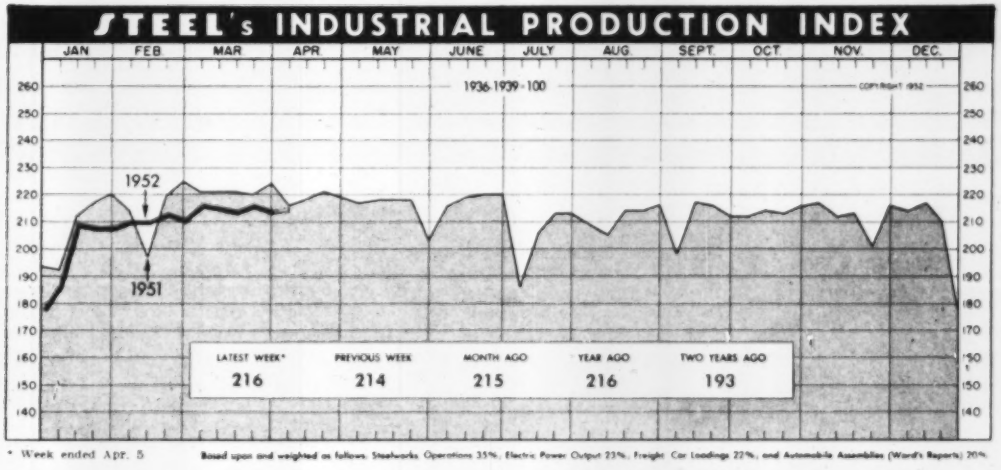


* Week ended Apr. 5 Based upon and weighted as follows: Steelworks Operations 35%, Electric Power Output 23%, Freight Car Loadings 22%, and Automobile Assemblies (Ward's Reports) 20%.

Hopes for favorable business in the months ahead will depend on the outcome of the steel dispute. Production index reflects a new activity high

BUSINESS ACTIVITY is still on its high plateau. Output of durable goods rose to a new post-war record in February, with indications that the production climb is continuing.

The Federal Reserve Board's production index for that month reached 222 per cent of the 1935-1939 average, a rise of 2 points from the previous month and a 1-point increase over the production rating for February, 1951.

Conditional—But hopes for favorable business weather in the spring and summer months would have been shattered by a prolonged steel strike.

The steel companies' preparations for an industry strike will produce a slight drop in the industrial activity level throughout the nation for the week ended Apr. 12.

Crystal Ball—Reflecting industrial activity, STEEL's production index will show a decline, due to the slowdown in steel operations. Following the drop in steel output, expect electric power and freight carloadings to take slight dips.

The high level of industrial production, until the steel crisis came along, is mirrored in STEEL's industrial activity index at the top of the page. The index moved up 2 points to 216 (1936-1939 = 100) in the week ended Apr. 5. That's the same reading for the like week last year.

The Breakdown — Substantial shifts in the "guns and butter economy" are concealed behind the production reading. Electric energy and steel output in the week ended Apr. 5 were above the year-ago volume, while auto and truck production remained well under that 1951 mark. Freight carloadings were substantially the same.

No Estimates . . .

While banking furnaces and laying off employees in expectation of an industry strike, steel companies didn't offer estimates of production in the week ended Apr. 12. The last estimate of production—for the previous week—was 2,120,000 net tons of ingots and steel for castings.

Spring Demand. . .

Warnings of an impending car shortage are being voiced by automakers. They say that dealers' stocks are low and present restrictions will keep them from meeting spring demand.

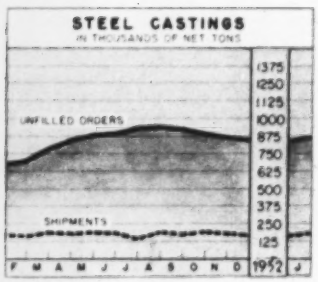
But reports of strong sales are coming from only the more popular carmakers. Automotive production has been lagging behind the 1951 output pace by 34 per cent, says *Ward's Automotive Reports*. April passenger car production is slated to rise by 9 per cent over the March turnout. U. S. car makers plan to complete about 411,000 units this month for late spring buying.

Combined U. S. and Canadian production dropped to 127,039 autos and trucks in the week ended Apr. 5. That's a decline of 5811 units from the previous week's output, when production made its usual end of the month speed-up. During the same week last year, U. S. and Canadian output totaled 158,076 units.

New Upsurge . . .

Contractors are sharpening their pencils, rolling up their sleeves and getting to work.

Construction outlays rose to $2.2 billion in March—up 13 per cent from February and slightly above the expenditures for March, 1951, reports the Commerce Department. The big increases came in the private homebuilding and highway

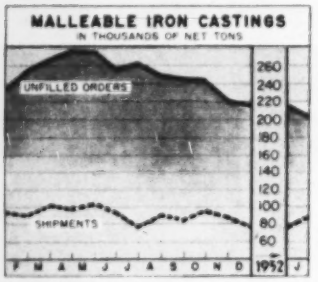


Steel Castings

Thousands of Net Tons

	Shipments 1952	Shipments 1951	Unfilled Orders* 1952	Unfilled Orders* 1951
Jan.	182.7	174.1	869.3	675.4
Feb.		164.0		707.4
Mar.		190.7		779.7
Apr.		181.9		846.9
May		189.2		881.7
June		184.7		895.1
July		147.2		930.0
Aug.		177.1		944.2
Sept.		160.7		918.0
Oct.		189.9		891.5
Nov.		176.7		865.0
Dec.		165.1		846.4
Total		2,093.3		

* For Sale. U. S. Bureau of the Census.

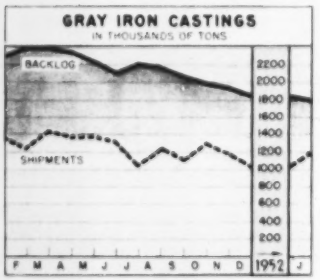


Malleable Iron Castings

Thousands of Net Tons

	Shipments 1952	Shipments 1951	Unfilled Orders* 1952	Unfilled Orders* 1951
Jan.	87.0	92.5	203	234
Feb.		89.0		255
Mar.		101.7		267
Apr.		97.3		276
May		100.8		273
June		93.7		256
July		76.8		263
Aug.		99.7		249
Sept.		82.3		245
Oct.		93.9		238
Nov.		88.2		221
Dec.		76.0		215
Total		1,082.9		

* For sale. U. S. Bureau of the Census.

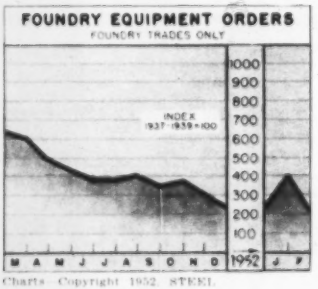


Gray Iron Castings

Thousands of Net Tons

	Shipments 1952	Shipments 1951	Backlogs* 1952	Backlogs* 1951
Jan.	1,199	1,364	1,801	2,298
Feb.		1,234		2,392
Mar.		1,440		2,390
Apr.		1,363		2,337
May		1,396		2,229
June		1,309		2,162
July		1,029		2,208
Aug.		1,219		2,145
Sept.		1,115		2,055
Oct.		1,302		1,983
Nov.		1,184		1,934
Dec.		1,032		1,847
Total		13,768		

*For sale. U. S. Bureau of the Census.



Foundry Equipment Orders

	Index 1952	Index 1951	Value Thousands 1952	Value Thousands 1951
Jan.	404.5	668.0	$1,862	$3,075
Feb.	200.4	638.6	922	2,940
Mar.		599.0		2,758
Apr.		490.1		2,256
May		431.7		1,987
June		393.2		1,810
July		390.3		1,797
Aug.		404.5		1,862
Sept.		346.5		1,595
Oct.		372.4		1,714
Nov.		305.5		1,406
Dec.		230.5		1,061

Foundry Equipment Mfrs. Assoc.

Charts—Copyright 1952, STEEL

Issue Dates of other FACTS and FIGURES Published by STEEL:

Construction	Mar. 31	Ironers	Jan. 21	Ranges, Gas	Feb. 25
Durable Goods	Mar. 31	Indus. Production	Feb. 18	Refrigerators	Feb. 25
Employ., Metalwkg.	Mar. 10	Machine Tools	Mar. 10	Steel Forgings	Apr. 7
Employ., Steel	Mar. 24	Prices	Feb. 18	Steel Shipments	Dec. 17
Fab. Struc. Steel	Apr. 7	Pumps	Mar. 31	Vacuum Cleaners	Mar. 24
Freight Cars	Mar. 10	Purchasing Power	Mar. 3	Wages, Metalwkg.	Jan. 28
Furnaces, Indus.	Mar. 31	Radio, TV	Mar. 24	Washers	Apr. 7
Gear Sales	Apr. 7	Ranges, Elec.	Feb. 25	Water Heaters	Mar. 24

construction categories. Boosts in outlays for military and defense production facilities offset declines in residential and commercial building from year-ago levels.

The upsurge in private home-building during March was the month's most outstanding construction development. The Commerce Department estimates total expenditures for residential building at $784 million, 17 per cent greater than February and only 9 per cent below the March, 1951, record.

As the cold weather draws to a close, seasonal increases in construction start. *Engineering News-Record* reports heavy construction awards totaled $345.7 million in the week ended Apr. 3. That figure marks a rise of $74 million over the previous week's total and more than $108 million for the comparable week in 1951.

Turning On the Juice . . .

Electric utilities are turning on the juice. Production of electric energy set a new record in February for that month. Energy from electric utilities totaled 31.5 billion kilowatt-hours, exceeding the February, 1951, total by 11.8 per cent, but 7.8 per cent below the record level of January, 1952. The Federal Power Commission says power generation for the year ending Feb. 29, 1952, is the highest for any 12 month period to date and 11.5 per cent greater than production during the year ending Feb. 28, 1951.

Piling Higher . . .

Stocks of bituminous coal continued to pile up in February. At the rate of consumption prevailing on Mar. 1, there was enough bituminous on hand to last 56 days. Stocks of bituminous coal on that date were reported at 76.5 million net tons, a million tons over the month-ago figure and an increase of more than 5 million over coal accumulated on Mar. 1, 1951.

Greatest stockpile gains over the year were reported by electric power utilities (26.4 per cent) and steel and rolling mills (22.2 per cent). Railroad and coke oven stocks were lower by 16 and 3.6 per cent, respectively. Stocks rose

slightly in each industrial category, says the association.

Wiped Out Half . . .

Foreign orders for U. S. machine tools dropped to $4.2 million in February, the lowest total since the National Machine Tool Builders Association started compiling statistics in 1918. Foreign orders fell from $10 million of new business in January, and were $25 million under the new business peak of March, 1951. Meanwhile, tool shipments continued to climb; the February total reached a new record in excess of $82 million.

The monthly statistical survey for February indicates that cancellations of contracts during the month by aircraft and engine builders wiped out almost half the incoming new orders in the final total. Backlog of new orders lost was estimated as equal to one month's shipments or slightly above $80 million.

Sales On Skids . . .

Radio and television receiver production in the first two months of 1952 skidded 43 per cent from the heights of early 1951. TV production was at 814,270 sets and radio output totaled 1.4 million receivers, says Radio-Television Manufacturers Association. Sales of receiving tubes in February dropped below those of the same period last year. Manufacturers in February sold 28.3 million tubes, compared to 36.8 million in February, 1951.

Continued Downdrift . . .

Wholesale prices continued to downdrift in the week ended Apr. 1, reports the Bureau of Labor Statistics. That week marked another slight drop of 0.3 per cent to 111.4 (1947-1949 = 100) in the wholesale price index. All commodities other than farm and foods showed only a 0.1 per cent decline to 112.9 per cent in the bureau's index for that week.

Trends Fore and Aft . . .

Foundry equipment orders dropped to $922,485 in February, less than half the January placement. . . . Department store sales jumped 13 per cent in the week ended Apr. 5 over the like 1951 week. But pre-Easter buying did it. . . . Consumer installment credit going into March totaled $13 billion, a drop of $108 million in one month . . . Orders for pumps rose $1.5 million in February.

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Output (per cent of capacity)[2]	102.0	102.0	103.0
Electric Power Distributed (million kwhr)	7,300[1]	7,263	6,735
Bituminous Coal Output (daily av.—1000 tons)	1 613	1 587	1,710
Petroleum Production (daily av.—1000 bbl)	6,300[1]	6,402	6,127
Construction Volume (ENR—millions)	$345.6	$271.6	$236.8
Automobile, Truck Output (Ward's—units)	127,039	132,850	158,076
TRADE			
Freight Car Loadings (unit—1000 cars)	730[1]	725	739
Business Failures (Dun & Bradstreet, number)	160[1]	164	195
Currency in Circulation (millions)[3]	$28,445	$28,329	$27,138
Dept. Store Sales (changes from year ago)[3]	+13%	−10%	−9%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$17,530	$17,083	$17,602
Federal Gross Debt (billions)	$258.1	$260.4	$255.0
Bond Volume, NYSE (millions)	$13.6	$13.5	$15.7
Stocks Sales, NYSE (thousands of shares)	7,553	6,807	7,482
Loans and Investments (billions)[4]	$73.7	$73.9	$70.2
United States Gov't. Obligations Held (billions)[4]	$32.0	$32.0	$30.9
PRICES			
STEEL's Weighted Finished Steel Price Index[5]	171.92[1]	171.92[1]	171.92
STEEL's Nonferrous Metal Price Index[6]	243.6	243.6	246.7
All Commodities[7]	111.4	111.7	112.6
All Commodities Other Than Farm and Foods[7]	112.9	113.0	114.0

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1951, 4,999,035; 1952, 2,077,040. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-1939=100. [6]1936-1939=100. [7]Bureau of Labor Statistics Index, 1947-1949=100.

A. I. S. I.

4130

Government Specification
AN-QQS-685
CONDITION "N"

CHROME-MOLY STEEL
AIRCRAFT QUALITY

Earmarked stocks
for aircraft or guided
missiles.

Standard Size Sheets
.025" to ½" thick

Some lighter gauges can be
furnished in coils.

Certification only

THE Kenilworth Steel co.
750 BOULEVARD
KENILWORTH, N. J.

SPECIALISTS IN FLAT ROLLED METAL PRODUCTS

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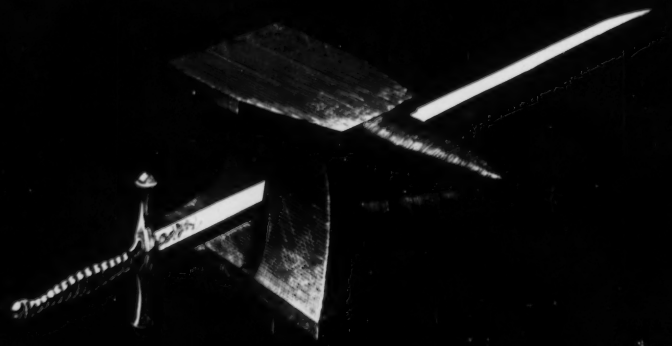


Famous Blades

Excalibur...

Blade of King Arthur... symbol of leadership

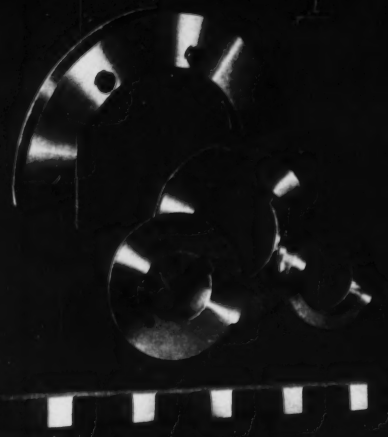
Created by the magician Merlin, Excalibur, the sword of King Arthur possessed great powers. Above all, it symbolized the authority and leadership of the King. Only Arthur, the true leader, had the power to remove Excalibur from the anvil in which it was embedded and wear it as ruler of all England.

Heppenstall SHEAR KNIVES ... symbols of leadership in outstanding service to industry

Users of Heppenstall Knives obtain exceptional service as represented by the following advantages:

- ★ MORE CUTS BETWEEN GRINDS
- ★ MORE UNITS PER BLADE
- ★ LOWER OVERALL BLADE COST
- ★ INCREASES IN PRODUCTION

Your shearing and trimming operations can also benefit through Heppenstall Shear Knives. Make them your standard specifications today.



Heppenstall

Men of Industry

C. E. RILEY
. . . gen. sales mgr. at McLouth Steel

JOHN E. NEWLIN JR.
. . . sales mgr., Disston steel div.

W. E. MASSEY
. . . new president of Weldit Inc.

C. E. Riley was appointed general sales manager, **McLouth Steel Corp.**, Detroit. **W. J. Cleary Jr.** was named manager of stainless sales, and **W. H. Adamson**, manager of carbon sales. Mr. Riley has been a member of the sales department since inception of the company in 1934.

George A. Dauphinais was elected vice president and general manager, **Quaker Rubber Division**, H. K. Porter Co. Inc., Philadelphia. He will be in charge of manufacturing and sales. At Quaker he was successively works manager and assistant general manager. Mr. Dauphinais joined the Porter organization in 1947 and held the position of plant manager with J. P. Devine Mfg. Co. Division and subsequently with Porter, the parent company.

R. C. Dickey, a member of the engineering division of **Ferro Corp.**, Cleveland, was promoted to general superintendent of erection.

Verson Allsteel Press Co., Chicago, appointed **Harry Ankeney** as works manager of its Chicago plant. He has been plant engineer.

Wilbur H. Norton, vice president of General Motors Corp., was named president and a director of **R. M. Hollingshead Corp.**, Camden, N. J. **Stewart Hollingshead**, president since 1945, becomes chairman of the executive committee.

John E. Newlin Jr. was appointed sales manager of the steel division of **Henry Disston & Sons Inc.**, Philadelphia. He succeeds **H. D. Siegfried**, retired after 27 years with the company. Mr. Newlin joined Disston in 1936. He was made assistant sales manager, steel division, in 1947.

James H. Ferguson, Toledo, O., sales engineer for **Strong, Carlisle & Hammond Co.**, was promoted to branch manager of the new Detroit office at 18133 James Couzens Highway. He is replaced in Toledo by **Richard C. Sauber**, who for the last four years was a senior engineer at Toledo Scale Co.

Harold F. Holtz was named sales manager, boiler division, **Cleaver-Brooks Co.**, Milwaukee. He formerly was advertising and marketing manager for the company. He succeeds **R. J. Tutsch**, resigned to form a manufacturing agency partnership with T. P. Dyke to handle Cleaver-Brooks equipment in Wisconsin.

James M. Gillespie has returned to **AiResearch Mfg. Co.**, division of Garrett Corp., Los Angeles, to serve on a full-time basis as manager, export department. He originally joined Garrett Corp. in 1948 as assistant and technical adviser to the president. During the last year he has been a consultant, dealing with AiResearch equipment in use overseas in the military defense program.

Weldit Inc., Detroit, elected **W. E. Massey** as president. He has been associated with the company as vice president and sales manager for over 32 years. **Joseph Smith**, formerly sales manager, was appointed vice president in charge of production.

John E. Spears, control manager, gas and coke division, **Koppers Co. Inc.**, Pittsburgh, since 1949, was named assistant general manager of that division. He will assist M. T. Herreid, vice president and division general manager, in operation of the division which operates plants at Kearny, N. J., and St. Paul.

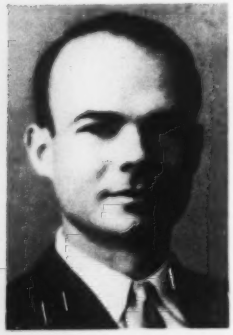
Bernard F. Coggan, former executive of General Motors Corp., was named manager of **Consolidated Vultee Aircraft Corp.'s** San Diego, Calif., division to succeed **K. F. Leaman**. Mr. Leaman was named assistant manager, guided missiles, at San Diego.

W. F. Dueringer was named engineer in charge of sales of **Allis-Chalmers Mfg. Co.'s** steam turbine section, Milwaukee. **J. T. Donovan** was appointed supervisor of sales of steam turbine-generator units below 15,000 kv, and **D. J. Nairn** as supervisor of sales of marine and navy turbine equipment.

Harry M. Frecker was appointed manager of commodity sales for the mechanical goods division, **United States Rubber Co.**, New York. **G. L. Dennis** was made

West Coast branch manager, Naugatuck Chemical Division.

William E. Miller was appointed manager of the steel mill section of **General Electric Co.'s** industrial



WILLIAM E. MILLER
. . . steel mill mgr. at GE

engineering department, Schenectady, N. Y. He succeeds **Hal W. Poole,** named manager of engineering for the company's newly created industry control department.

Dr. E. S. Rowland, research metallurgical engineer, was promoted to chief metallurgical engineer of **Timken Roller Bearing Co.,** Canton, O.

George W. Bulmer and **Robert J. Kay** were appointed, respectively, manager of sales, and assistant manager of sales, merchant trade products, **Northwestern Steel & Wire Co.,** Sterling, Ill.

Neal J. Coleman was elected vice president, administration, **Pacific Airmotive Corp.,** Burbank, Calif.

Charles L. Moseley, for the last 13 years manager of the Rochester, N. Y., office of **Chase Brass & Copper Co.,** was transferred to Waterbury, Conn., where he assumes the position of district manager of the Chase - Waterbury territory. He succeeds **Wooster Canfield,** who will retire about Sept. 1 and will serve in an advisory capacity until retirement.

L. R. Hills was appointed district sales manager for the recently established New York branch office of **E. W. Bliss Co.,** Canton, O. The new New York area office is located at 50 Church St., New York 7.

Pittsburgh Steel Co., Pittsburgh, appointed **A. J. Harris** manager, commercial research. He was sales analyst.

Nesco Inc., Chicago, appointed **M. A. Simpson** factory manager of its Granite City, Ill., plant. He previously was works manager for Acme Metal Products Corp.

Kennametal Inc., Latrobe, Pa., appointed **S. Allen Oviatt** as manager of sales engineering, Kentanium products.

Harry Adelman was appointed advertising and sales promotion manager, **Arrow Electronics Inc.,** New York.

Jerome F. Ferdinand was elected vice president in charge of sales,

JEROME F. FERDINAND
. . . Wales-Strippit V. P.-sales

Wales-Strippit Corp., North Tonawanda, N. Y., manufacturer of machine tools and metal fabricating machinery. He joined the company in 1943 as a tool designer in the engineering department. In 1946 he was promoted to works manager in charge of all production. In 1949 he became sales manager.

K. Herbert Link has joined **Pipe Machinery Co.,** Gage Division, Cleveland, as sales representative in the New York area.

John E. Pixton, retired Navy captain, was made field engineering manager of the Washington zone of **General Motors Corp.'s** Allison Division.

C. W. Martin was appointed die sales and service engineer for **Carboloy Department,** General Electric Co., in the Pittsburgh office. He succeeds the late **R. R. Preston.**

Robert V. Merrick was appointed by **Willys-Overland Motors Inc.,** Toledo, O., as assistant sales manager, Region 4, with headquarters in Kansas City, Mo.

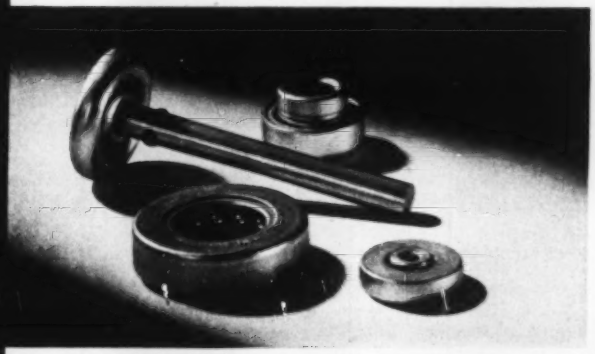
Walter N. Fritts was promoted to general sales manager of Electro-Motive Division, La Grange, Ill., **General Motors Corp.** He succeeds **O. F. Brookmeyer,** who was placed on special assignment. The eastern region of the division has been divided into two regions: One will be at New York, still known as the eastern region, and headed by **G. M. La Riviere,** who was transferred from manager, St. Louis region. The other will have headquarters at Washington, to be known as the southeastern region, with **R. L. Terrell** as manager. **F. W. Walker** was transferred from district sales manager, Chicago region, to manager, St. Louis region; **George W. Rukgaber,** from sales manager, east central district, Chicago region, to sales manager, western district, Chicago; **Floyd E. Von Ohlen,** sales representative, Chicago region, to sales manager, east central district, Chicago.

DeVilbiss Co., Toledo, O., appointed **Henry M. Kidd** vice president and sales manager of its spray painting equipment division. Asso-

HENRY M. KIDD
. . . named V. P. at DeVilbiss

ciated with the company for more than 18 years, he was made sales manager of the division in October, 1950. Headquarters of the Middle Eastern States district have been moved from Cleveland to To-

PRESS BREAKDOWNS ENDED BY SUNTAC



NO MORE MANUFACTURING DELAYS. The manufacturer of these bearings uses heavy-duty presses to blank out parts. The problem of press bearing failures due to inadequate oils has been eliminated by changing to Suntac.

CLEAN FLOOR, CLEAN MACHINE. Adhesiveness prevents Suntac Oil from squeezing out of the bearings. Before Suntac was used, floors had to be cleaned constantly to keep them from becoming slippery and dangerous.

A large ball-bearing manufacturer was having trouble with the oil used in some older heavy-duty presses. At frequent intervals the machinery had to be shut down due to bearings overheating. Because the oil would not *stay in*, bearing life averaged only eight months. Each failure took a press off the line for a month or more. Floors had to be cleaned constantly to keep them from becoming slippery and hazardous. Many different oils were tried in an effort to remedy the situation, but none proved adequate for the job, and production suffered.

Finally the company called in a Sun representative for consultation and changed to a Suntac Oil at his suggestion. Results were excellent, and the presses have operated without a bearing failure ever since. The adhesiveness of Suntac prevents it from squeezing out and keeps the bearings running cool. For the same reason the floors around the presses are free from oil-drip. Oil consumption has been cut 50 percent.

If you are having trouble keeping old or worn equipment *on the job*, use the coupon below.

SUN OIL COMPANY, Dept. S-4, Philadelphia 3, Pa.

We are having bearing failures possibly caused by faulty lubrication.

- ☐ Please have a Sun representative call.
- ☐ Send me your booklet "Suntac Oils Case Histories."
- ☐ Send me your technical bulletin "Lubrication of Industrial Machinery."

Name_____

Title_____

Company_____

Street_____

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TECHNICAL ASSISTANCE AVAILABLE. Sun's engineers are at your service for consultation on lubrication matters. It will pay you to utilize the broad experience they have gained in solving a wide variety of problems in many different industries.

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C. N. REES
. . . V. P.-mfg. at Standard Steel

JAMES A. WARD
. . . gen. mgr. Remington Rand plant

LEE FRASER
. . . Arma Corp. production mgr.

ledo, O. **Roger F. Whitell** remains as district manager.

Standard Steel Corp., Los Angeles, manufacturer of heavy processing equipment, promoted **C. N. Rees** to vice president in charge of manufacturing in addition to his duties as sales manager. Associated with the company for three years, Mr. Rees formerly was vice president-sales manager with Southwestern Engineering Co.

William H. McGaughey, for 13 years a member of the staff of Automobile Manufacturers Assn., joined **Nash-Kelvinator Corp.**, Detroit, as assistant to George Romney, vice president and chairman of the operating committee.

James A. Ward was named general manager of Louisiana Ordnance Plant, operated by **Remington Rand Inc.**, New York. Formerly assistant general manager of Remington Rand, Mr. Ward replaces **T. C. Gerber**, resigned.

W. S. Schneider was appointed sales representative by **Selas Corp. of America**, New York. His headquarters are Rochester, N. Y.

J. S. Roscoe, director of purchasing, and **G. E. Tenney**, service manager, were elected to the board of **Lincoln Electric Co.**, Cleveland.

Paul H. Bjurberg was appointed superintendent, electric furnace department, Midland Works, **Crucible Steel Co. of America**, Pittsburgh.

Lee Fraser was made production manager of **Arma Corp.**, Brooklyn and Mineola, N. Y., subsidiary of American Bosch Corp. He has been staff assistant to the vice president-manufacturing.

D. G. Calkins was placed in charge of the new radiochemistry department of **Industrial Nucleonics Corp.**, Columbus, O.

Lawrence M. Limbach, formerly manager of operations, steel and tube division, Republic Steel Corp., was appointed works manager, **Ryan Aeronautical Co.**, San Diego, Calif. Managers of the production and factory services divisions, reporting to Mr. Limbach, are respectively **H. J. Van Der Linde** and **H. P. Rasp.**

OBITUARIES . . .

Chisholm N. Macdonald, 51, president, **Gear Grinding Machine Co.**, and **Formsprag Co.**, both of Detroit, died Mar. 25.

Ward A. Wickwire, former executive vice president, **Wickwire Steel Corp.**, Wickwire Limestone Co., Wickwire Iron Ore Co. and Wickwire Spencer Steel Co., with headquarters in Buffalo, died Apr. 1. In 1924 he severed connections with the business which in 1945 became the Buffalo plant of the Wickwire Spencer Steel Division, Colorado Fuel & Iron Corp.

Daniel E. Kinkley, 67, president, **Hy-grade Metal Products Inc.**, Syracuse, N. Y., died Apr. 1.

Loughlin MacAllister, 58, superintendent of the forge shop at **Erie Forge & Steel Co.**, Erie, Pa., died Mar. 30 of a heart attack.

Forrest Nagler, 66, who retired Mar. 1 as manager and chief engineer of **Allis-Chalmers Mfg. Co.'s** atomic power section, died Apr. 1.

Samuel H. Conwell, 64, retired vice president, **Standard Railway Equipment Mfg. Co.**, Chicago, died Apr. 2 in Saratoga, Calif., of a heart attack.

John F. Kamen, 83, president, **Chicago Coil Spring Co.**, Chicago, which he founded 35 years ago, died Apr. 1.

Chester D. Mott, 64, research engineer for **Fansteel Metallurgical Corp.**, North Chicago, Ill., died Apr. 1.

Charles F. Vesely, 53, safety manager, **Howard Foundry Co.**, Chicago, died Apr. 3.

Dr. Lewis W. Chubb, 69, director emeritus of **Westinghouse Research Laboratories**, Westinghouse Electric Corp., Pittsburgh, died Apr. 2.

Charles F. Schroeder, 71, president and founder, **Victor Products Corp.**, Chicago, bolt manufacturer, died Apr. 4, in Florida.

David T. Croxton, 79, one-time leader in the pig iron field in Cleveland and northern Ohio, died, Apr. 5 while traveling in Mexico.

Edwin F. Cone, from 1935 to 1943 editor of *Metals & Alloys*, now known as *Materials & Methods*, died Mar. 18. He had retired in 1947. Previous to 1935 Mr. Cone served as associate editor of *Iron Age* for 20 years.

Hand Operated Air Valves Dumping Poured Molds onto Apron Conveyor in Foundry

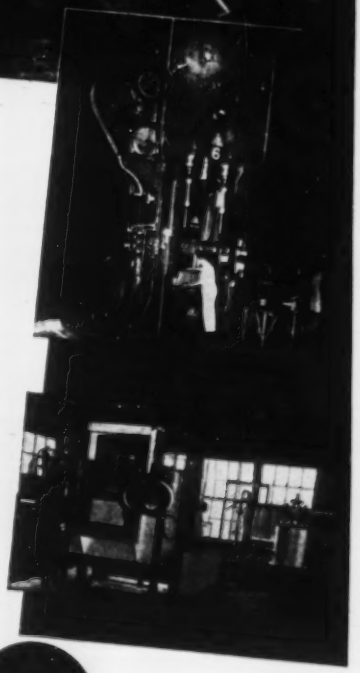
Quick-As-Wink Control Valves

un-paralleled performance and dependability

no after hours Siss-s-s-s

That low sizzling noise you hear out in the plant, after the work force has gone home, is there during the day too, only you can't hear it then. It's air. Seeping out through inferior valves it wastes from $5.00 to $500.00 per month — and — leaky valves mean sloppy machine control; danger of "repeating"; possible injury to the operator; or a break-down involving costly repairs, material spoilage, lost production and customer ill-will.

Stop that sizzling by installing Quick-As-Wink valves on your air and hydraulic controls. Positive and fast-acting Quick-As-Wink valves are designed and built with U-shaped packers that are expanded by pressure and seal tightly, preventing leaks, and minimizing the danger of break-downs and tie-ups. Recognized by operators, foremen and superintendents everywhere for unsurpassed air economy, high efficiency, low maintenance and long, trouble-free satisfactory performance.



Quick-As-Wink

AIR AND HYDRAULIC

Control Valves

Hand, Foot, Cam, Diaphragm and Solenoid Operated

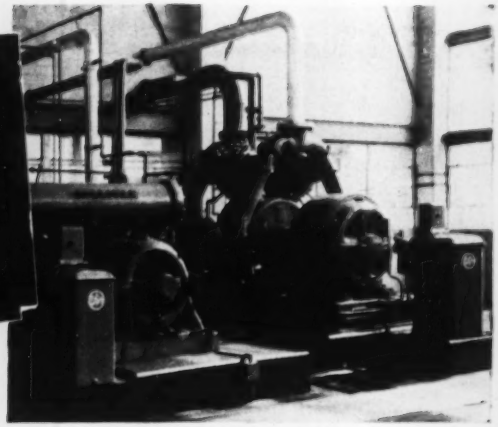
Mfd. by C. B. HUNT & SON, INC., 1911 East Pershing St., Salem, Ohio

EC&M OIL-IMMERSED Motor Starters

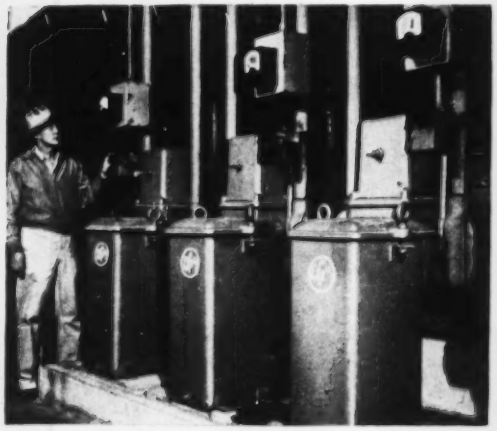
A BIG AID TO PRODUCTION
OIL-IMMERSED FOR LOW MAINTENANCE

Compensator mechanism

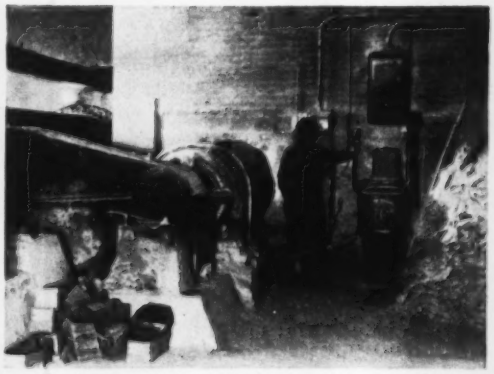
Complete compensator



Air Compressor Installation



For Grain Processing Machines



Grinding Mill Installation

Many industrial plants rely on EC&M auto-transformer 220-550 volt Motor Starters for continuity of production. Oil-immersed, these starters are always well lubricated and protected from corrosion — *the need for frequent inspection or maintenance is eliminated.* Motor circuits are made and broken under oil—thoroughly safe, no dust hazards.

The compensator mechanism uses a simple, double-throw contactor requiring only one magnet coil—transition from reduced voltage starting to full voltage running is *automatic.* Squirrel-cage or synchronous motors are brought up to speed quickly, safely—with greater skill than human hands could do it.

Overload relays give inverse-time-element protection and also *trip instantly* on heavy over-currents. A magnetic balance in each relay absorbs heavy starting currents and allows a *low* current setting for accurate protection under running conditions.

Write for Bulletin 1045 and No. 19 ACCELERATOR Bulletin

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Production AND Engineering
NEWS AT A GLANCE

METAL TO NONMETAL BRAZING—Brazing technique for joining both metals and nonmetallic materials with active metals like titanium, zirconium, columbium and tantalum may some day be widely used in the electronics industry. Good vacuum seals with glass and ceramic have been prepared by the method. The brazing is carried out with fluxes in controlled atmospheres and in vacuums. Active metals have the interesting property of wetting both metals and nonmetallic materials equally well, producing strong bonds which can exceed the strength of the nonmetallics. Applications of the process are not limited to vacuum techniques but should be useful in the manufacture of tools or other devices for which nonmetallics are bonded to metal.

TRAILER-FED TANK LINES—Engineered materials handling at the Cadillac-Cleveland tank plant revolves about a complex trackless train system. Basic handling units are heavy-duty eight-way entry pallets, deep collapsible wire containers, deep corrugated shop boxes and standard tank plant shop trailers. Tractors furnish the power. Specially designed racks handle and store parts and assemblies. p. 92

SMASH-PROOF CARBOY—Latest development in transporting acids in bulk quantities is a smash-proof plywood carboy equipped with a huge plastic bottle. The new carboy, made in 6½ and 13-gallon capacities is round instead of square and occupies only half the space formerly required. Cost of shipping the package alone is expected to drop about 60 per cent. The 13-gallon polyethylene-plywood carboy unit weighs only 29 pounds as compared to 70 pounds for boxed glass carboy bottles of similar capacity.

STABILIZE AT 120 BELOW—Complete stabilization of steel through 100 per cent transformation of austenite to martensite can be accomplished by repeated cycles of heating to room temperature and chilling to 120 F below zero, say engineers of Deepfreeze Distributing Corp. In a few hours the same metal stability can be obtained that usually requires years of aging. Other uses of subzero equipment: Shrink assembly, treatment of tool steels, gage-seasoning, gas dehydration, metal testing.

NONFERROUS TUBE MILLS FASTER—Aluminum alloys in coiled sheet form, copper alloys, nickel, Monel, Inconel are some of the nonferrous metals that can be electrically welded into tubing by a new process. The method welds at speeds of 50 to 90 feet per minute. Yoder Co. engineers say the technique is 1000 per cent faster than previous methods. Mills have a total capacity range of ¾-inch to 8 inch diameter on metal thicknesses ranging from 0.025 up to 0.140-inch.

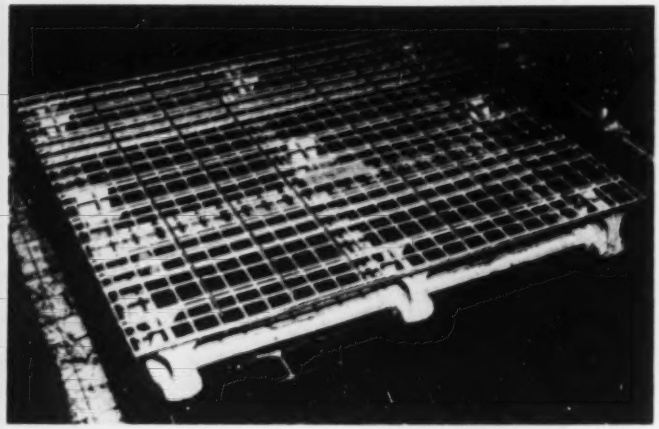
Mg SHEET ROLLS LIKE Fe—Magnesium sheet will soon be rolled on modern high-production mills similar to those used to produce steel and aluminum sheet for the commercial markets. Dow Chemical Co. is installing an 84-inch coil mill that will process 2000-pound ingots. Present equipment rolls 140-pound ingots. The new ingot is equivalent in volume to an 8800-pound steel ingot. Existing magnesium rolling facilities are pressed to capacity to produce sheet for airframe manufacturers.

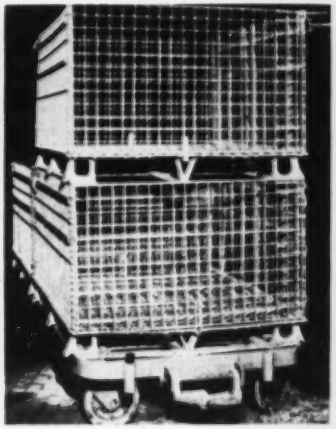
FOR MORE DIAMONDS: SALVAGE—Available supply of industrial diamonds is not adequate to fill current requirements. What can you do to ease the pinch? NPA recommends that you make an inspection and inventory of any accumulation of broken, worn out or obsolete diamond grinding wheels and tools. Your supplier will reimburse you for the reclaimed diamonds. Follow the supplier's instructions on the best salvaging methods. p. 97

LONGER POT LIFE—A thin refractory lining attached to the inside wall of a galvanizing pot is a significant development in galvanizing technology. The idea is to increase pot life by eliminating solution of iron from the pot and so reduce dross production. This is expected to permit higher pot operating temperatures and yield more ductile coats. The lining can be applied cold to any portion of the pot where corrosion is severe.

CHECKS SMOKE SPECKS—An instrument that will measure accurately size of aerosol particles (minute particles suspended in air) may make possible the development of better smoke filters. The optical device operates on the principle that aerosol particles change the angle of polarization of a beam of light going through the air. An electronic arrangement added to the optical device increases the sensitivity so that changes of 0.0002-micron in aerosol particle radius can be detected.

LAGOONS, SIPHONS AND SLUDGE—Nontoxic metalworking wastes can be treated successfully and economically by a simple, low-cost lagooning system consisting of detention basins, siphons. An automobile axle plant processes soluble oil emulsions and other wastes at a flow of about 200,000 gallons per day. The effluent meets stringent disposal requirements. p. 98





Reinforced collapsible sides added to an eight-way entry wire pallet (left) makes the sturdy wire container that can be stacked as shown (right)

Engineered Materials Handling . . .

Lightens Burden of Heavy Tank Production

Materials handling engineers design rugged equipment that bears up under rigors of mass-producing heavy tanks

WHEN the Cadillac - Cleveland tank plant was established, engineers found plenty of problems confronting them. Aside from the basic one of converting light assembly plant to heavy manufacturing, there was the big problem of materials handling. Equipment doing a good job for auto production, wouldn't work for tanks. Standard shop trailers used in the trackless train system, for example, could not stand up under heavy loads. General use material handling equipment wasn't big enough for the job it had to do.

Yet the great distances to be traveled in the vast tank plant made a trackless train system desirable. Past automotive experience showed this method of handling economical and efficient and paved the way at Cadillac for a specially-engineered trackless train system. All units are rugged, durable and able to stand up under the wear and tear of transporting heavy tank components.

Four basic materials handling units are used: Heavy duty eight-way entry wire pallet; heavy duty deep collapsible wire container; deep corrugated shop box; standard tank plant shop trailer. Pallet has malleable iron legs and reinforced top deck. It is strong, durable and yet weighs 50 pounds less than a comparable wood pallet.

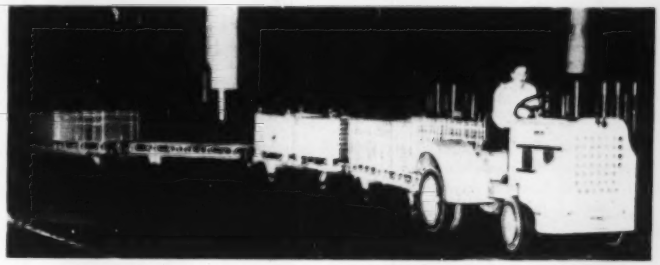
Collapsible wire container is made by adding reinforced sides to a wire pallet. Interchangeability of the two makes for greater flexibility. Corrugated shop box is used to handle unusually heavy parts and as a chip, sludge and rubbish container. Box has dump loops and crane hooks for handling by overhead crane.

Light, Strong Trailer — Shop trailer handles any mixed combination of pallets, containers and shop boxes. Despite its load capacity, weight and size, it can be easily moved by one man. Specially designed wheels and wheel bearings do the trick making this heavy duty trailer as easy to move as smaller shop trailers commonly seen in industry.

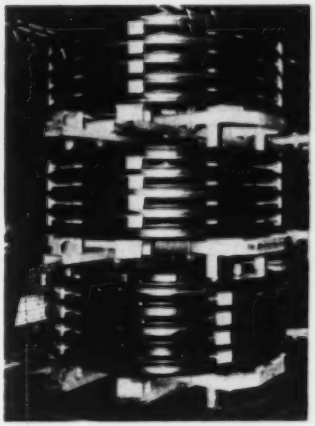
All pallets and containers are standardized at 40 x 48 inches. Containers all have a 24-inch depth. Standardization makes for most efficient use of space in highway truck or railway cars and also saves plant floor space.

The specially designed racks to handle and store machined parts and assemblies have some standard features. All racks can be handled by overhead crane, fork truck, hand walkie, and all types will fit on tank plant shop trailers. They stack on each other, empty or full, and fit with maximum efficiency in highway trucks or railway cars. Last feature is impor-

Unwieldly coffin-like box is replaced by strong, easily handled gun racks



This heavy-duty shop trailer moves heavy loads easily and is designed to accommodate any combination of pallets, containers, racks and shop boxes



Turret ring racks protect precision machined surfaces and are handled easily

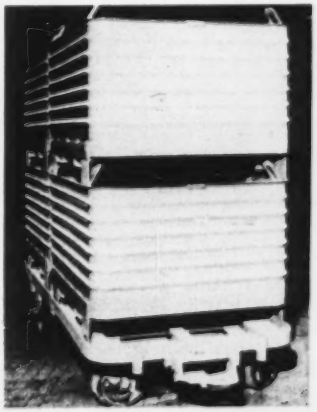
tant because Cadillac manufactures parts for other tank builders. These parts need not be rehandled and reloaded in other containers for shipment.

Turret Ring Rack—A big problem was handling, storing and shipping ball bearing turret races. Race is a 900-pound ball bearing assembly precision-machined that must be handled efficiently, without damage. After experimenting with several samples, the final design was selected—a precision fixture that permits most efficient handling and storage.

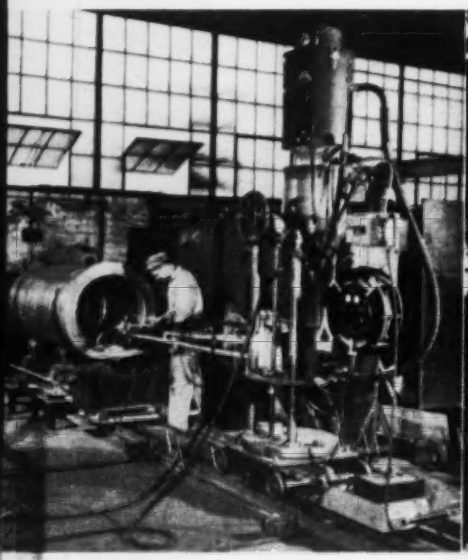
Other assemblies posed other problems. Each problem was met and solved by a tailor-made fixture. Guns or gun tubes were formerly handled in huge coffin-like boxes that were a safety hazard to handle and store. These are replaced by a special gun rack that stacks well, can be handled easily by fork truck, and is safe. Storage and handling of final drive assemblies each weighing 800 pounds is accomplished easily with other special handling racks.

Although all racks were specially designed, they were made of standard materials. Standard structural members, such as channels, angles, plates and pipe were used wherever possible. This was done with several objectives in mind. First was ease of fabrication and design; second, maximum strength to weight ratio; third, ease of procurement from outside competitive sources; fourth, ease of maintenance and repair.

Cleveland tank plant offered a good opportunity to engineer and tool up a plant for materials handling, from floor to ceiling; from general use equipment to huge machines. Every movement of material was studied, not only from receiving to shipping but from the raw stock in the supplier's plant.



Heavy-duty shop boxes handle unusually heavy parts, also serve as chip, sludge and rubbish containers



Submerged arc welding a stainless steel end ring into forged opening of water pump barrel using standard welder mounted in a special fixture

Pipeline pump is cast in four sections then welded. With welding, bevel detail is incorporated in pattern and no joint preparation is necessary

Specially designed submerged arc welding installation that cuts plug welding time of tong parts from 1 hour to 2 minutes for each plug weld

Shielded, Submerged Arc Welds Withstand

Massive components for heavy duty assemblies can be successfully welded if electrodes are properly selected and correct heat treating and welding techniques are employed

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Byron Jackson Co.
Los Angeles

WELDING provides the centrifugal pump and oilfield tool industry with a valuable tool. Production of some pieces of equipment without welding would be extremely difficult, if not impossible. As a fabrication, repair and maintenance tool, fusion welding has become as indispensable as casting, machining and heat treating. If proper precautions are observed, dependable and quality weldments can be applied to high tensile, heat-resistant and corrosion-resistant alloys; whether in a cast, forged or wrought condition.

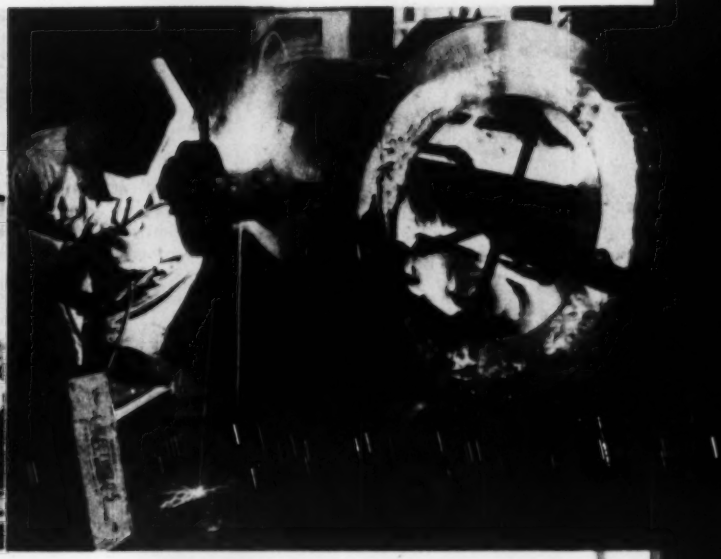
Materials used in the manufacture of centrifugal pumps depend upon the final service. Pump designer considers not only strength requirements, but resistance to corrosion, abrasion, fatigue and impact properties from subzero to elevated temperatures. Frequently used for pump construction are carbon and low-alloy, high tensile steels; practically all of the stainless group, Hastelloys, Inconel, Monel and many others.

Electrode Important—Each requires proper filler rod material to duplicate, as closely as possible, physical or chemical properties of the material to be fusion welded. Material control is exceedingly important. Exacting control must be maintained on filler rod material, joint design, welding procedure, the operator's ability and the physical, chemical and thermal characteristics of the material.

Outer barrel of a double case boiler feed water pump offers a typical welding application. It may be of forged or cast low-carbon or stainless steel. Barrel varies in weight, again dependent upon service requirements, from a few hundred pounds to as much as 6000 pounds when finish-machined. The wall sections range from 2 to 6 inches in thickness and have a rough-forged weight of about 10,000 pounds. They go through about five machining operations: Turning of the outside and inside diameter, preparing end-plate bevel for welding and milling the nozzle openings.

Into forged opening at an end of barrel is welded an end ring of type 410 stainless. Stainless end-plate and shoulder of the carbon steel barrel are beveled to make a welding vee, 1 inch wide by 1½ inches deep. This is a submerged arc welding application utilizing a standard Unionmelt welding machine, mounted in a gantry-type

Suction elbow for Grand Coulee which will use most massive welded pumps ever built. The completed pump weighs 300,000 pounds



Welding a cast type 410 stainless discharge nozzle to a forged carbon steel pump barrel. A spider-type gas burner is inserted in the bore of the barrel to maintain the required preheat

Rugged Service

fixture. Single-vee end-plate weld is completed in 1 hour and 23 minutes. With previous manual shielded-arc procedure, time was 10 hours. Twenty-five pounds of 3/32-inch diameter type 410 wire is deposited in twenty passes without stopping.

Corrosion Prevention—Submerged arc welding is also used to deposit an overlay of stainless steel, within the bore of the barrel. Purpose is to prevent corrosion at the inner volute fits. Special extension nozzles, of various lengths, reach into the interior of the barrel to facilitate the welding process. Rate of deposit is approximately 20 pounds per hour, as compared with 2 pounds per hour by conventional manual welding methods. Overlay on E-1020 carbon steel is made without any type of preheating.

Desirable features of this submerged arc installation are: Vertical, adjustable platform to raise or lower the welding nozzle; the Unionmelt flux is fed by air pressure to the weld through one of the tubes of the nozzle extension; unused flux goes back to flux reservoir by the vacuum cleaner adaptation connected to flux chamber; entire unit can be moved to either the horizontal or vertical station while work is being set up on the other; welding carriage hook-up, synchronized with the speed of the positioner, automatically moves the proper distance for the next over-lapping bead. Hook-up allows proper carriage travel for the welding of long straight seams.

Illustrated is the welding of a cast type 410 stainless discharge nozzle to a forged E-1020 carbon steel pump barrel. Unit is designed for a hot oil application. Superior erosion properties are required for suction and discharge nozzles. Spider-type gas burner is inserted in the bore of the barrel in order to maintain required preheat. Type 410 stainless is preheated uniformly to 500-700° F. No welding is permitted below 400° F. Temperatures are checked with Tempil-Stiks. Weldments are made with lime-coated electrodes, using direct current reverse polarity, and, wherever possible, the work is positioned for downhand welding.

Cast-Weld Construction — Cast-weld construction is of benefit in the production of intricate structures. An interesting application of cast-weld construction is the low-carbon, cast steel pipeline pump shown. Size of the casting and design precludes procuring a sound, homogeneous casting, so this cross-over cover was cast in four sections. With welding, bevel detail was incorporated in the pattern, no joint preparation being necessary. The material is ASTM A216 grade WCB, with a 0.35 per cent carbon maximum.

All welds are manual multiple-pass made without preheating. Welding rod utilized is a low-hydrogen, mineral-coated E-7015 electrode. Cast-weld unit is furnace stress relieved at 1250° F. This pump is used on the Trans-Arabian pipeline. It is connected to a 6000-hp steam turbine, operating at a speed of 3600 rpm and will deliver 400,000 barrels of oil every 24 hours.

Massive Welds — Most massive centrifugal pumps of welded fabrication ever built are the six for

Hook body component (left) for oil field use weighs 2100 pounds gets a weld that is durable and has all characteristics of parent metal if proper heat treating, welding techniques are used. Result of incorrect procedures is shown at right

Grand Coulee Dam, being built by Pelton Water Wheel Co., San Francisco. They are the result of joint design-hydraulics by Byron Jackson Co., Los Angeles, and mechanics and construction by the Pelton company.

Each pump, when completed, will weigh over 300,000 pounds. The impeller, a steel casting, and the only component not of welded construction, is 14 feet in diameter and mounted on a 27-inch diameter shaft. Casting, made in a single pour, required approximately 100,000 pounds of steel. Each pump will be driven by a 65,000-hp motor. Suction pipe is 14 feet in diameter and discharge pipe measures 12 feet in diameter. Pumps are designed to handle 700,000 gallons of water per minute or over one billion gallons of water per day.

Oil Field Tools — Oil well tools today meet service demands unheard of a few years ago. Deeper drilling is necessary. Oil tool industry has constantly sought better tools and better manufacturing operations. Largest percentage of oil tools are of cast construction and the weld shop plays an important part in our operations. Fusion welding as used in the production of oil field tools is divided into two categories—manufacturing and reclamation.

The welding of alloy steel castings is almost entirely a shop process. Castings receive a preheating and stress-relief heat-treatment. Under shop conditions, welding control is more ideal, higher percentages of carbon and various alloying elements may be used, yet the casting is still considered weldable.

Welds are manual, multiple-pass. Electrodes are selected for physical properties equivalent to the material being welded, after suitable heat-treatment. For low alloy, high hardenability steels, a low-hydrogen, lime-ferritic E-12016 rod is used. Room temperature physical tests of production welded joint specimens using this electrode indicate satisfactory properties. It is used primarily for strength welds.

An indication of casting size that can be welded is a hook body component. It has a maximum section of about 14 inches and weighs about 2100 pounds. Material is a modified NE 8630 and is used in a normalized and tempered condition.

The casting is designed to carry a rated load of 300 tons with a safety factor of 4 to 1. Welds on a casting of this type must be properly made. Procedure consists of furnace heating the casting to normalizing temperature, which is 1700° F, holding to insure thorough heating and removing the casting from the furnace.

Casting cools to 600-700° F for welding. After welding, casting is allowed to cool to atmospheric temperature, then it is returned to heat-treat for tempering. Hardness inspection, shot-blasting and Magnafluxing follow. This procedure eliminates a special heating operation for welding and assures a weld that possessses equivalent properties to the parent metal. Welding rod is a low-hydrogen AWS class E 12016.

Result of improper welding control is illustrated. This progressive failure of a 300-ton hook body resulted from a weld made in the field. Welding rod was incorrect and material wasn't stress-relieved after welding.

Another type of weld made on elevator castings requires some exacting properties. This is an overlay weld made with a 5/32-inch diameter low-hydrogen electrode. Rod used is a high-carbon, medium-manganese core wire with an all mineral coating.

Rod adequately satisfies four primary requirements: Freedom from porosity and cracking; machinability under ordinary shop conditions, after stress relieving; good impact resistance; and flame hardenability to 48-52 R/c. Surface to be overlaid is undercut 3/16-inch preparatory to welding. Casting is preheated to 500-700°F before welding, stress-relieved at 1150° F then quenched and tempered to specification.

Know the Material—Welding alloy steel castings of high hardenability will result in possible failure unless the operator is fully acquainted with the characteristics of the material to be welded.

A considerable saving in time and quality has resulted with a specially designed submerged arc installation, used for plug welding of various tong parts. With this installation, welding time is cut from 1 hour to 2 minutes for each plug weld. Welds are sound, homogeneous and possess equivalent physical properties to the material being welded.

INDUSTRY:

Short-Suited in Diamonds

Increased demand is causing a shortage of industrial diamonds. Proper use of diamond tools and wheels plus high efficiency salvage seems to be only way out

DEMAND for industrial diamonds greatly exceeds the supply. The acute shortage of crushing bort—a type of industrial diamond largely used in grinding wheels—underscores the need for immediate and intensive salvage. NPA is assisting the Industrial Diamond Salvage Committee in promoting the conservation, collection and reclamation of industrial diamonds.

At the outset of World War II there was a world crushing bort inventory of approximately 40 million carats. From 1939 to 1950, both this reserve and current production were absorbed. During World War II, 11 million carats of crushing bort were consumed annually during peak production. Industry is now approaching another peak. Today it must rely on current production, and crushing bort requirements in the U. S. are in excess of the present rate of import and reclamation.

Grave as the problem is, it can be eased by concentrated efforts of industrial diamond consumers. Diamonds can be salvaged in large quantity from the swarf and sludge of the diamond-bearing grinding wheels and tools and can be reused in the manufacture of new ones.

Industrial diamonds are required in diamond-impregnated grinding wheels, diamond-tipped tools for truing and dressing grinding wheels, diamond-tipped turning tools, diamond drill bits, diamond dies for drawing fine wire, shaped diamond tools and many other diamond products used in industry.

Bort Scarcest—Crushing bort, the type of industrial diamond now in shortest supply, is the most efficient material for grinding and sharpening cemented-carbide tools. These carbide cutting tools are essential to the production of many products required for defense and civilian use, including jet aircraft engines, guns, tanks, high-explosive shells and other defense materiel. With respect to this fact, Charles E. Wilson, former director of defense mobilization, says, "A deficiency of industrial diamonds would cause a breakdown in our vast metalworking industry, and would devastate mass production."

Africa supplies 96 per cent of our industrial diamond requirements, of which approximately 75 per cent is crushing bort. Diamond grinding wheels use at least 80 per cent of the crushing bort to provide the abrasive element.

Salvage Is Vital—From present indications, the available supply of industrial diamonds may not be sufficient to fill scheduled requirements. Since there is no adequate substitute, the salvage program is vital as the means of increasing the present supply.

Here are some of the things NPA recommends you as a consumer can do to ease the pinch: Make an inspection and inventory of any accumulation of worn out, broken and obsolete diamond grinding wheels and tools. Call your supplier and he will reimburse you for the reclaimed diamonds.

Make someone responsible for forming an in-plant salvage committee, and put into effect a program to improve salvage practices —bringing the importance of the program to the attention of all personnel who handle industrial diamonds in any form.

Let your supplier instruct your personnel in the best methods of salvaging diamonds in your plant. Then make a frequent check of wheel and tool handling and of swarf and sludge collection, to keep in line with proper operating procedures.

One Source: Sludge — Since a greater percentage of diamonds is saved in wet over dry grinding, wet grinding should be used whenever the application permits. Sludge from wet grinding should be saved. A settling tank should be added to the machine to prevent runoff of diamond materials finer than 325-grit. Collect sludge from diamond wheels separate from grindings of other abrasive wheels.

In dry grinding, a mist coolant or wick should be applied whenever applicable. This lengthens the life of the wheel. Recovery of swarf from dry grinding can be made with relative ease by using converted vacuum cleaners with disposable paper bags. Also, disposable vacuum cleaner bags can be placed in the exhaust system that is connected to the grinding machine.

Never Wear Out — Diamonds mounted in tools, wheel dressers, drilling bits, wire drawing dies, glass-cutting tools and other diamond-containing products are never completely worn out. Instruct operators in their proper use and collect them for salvage, sale and reuse when they are worn.

Diamond merchants, diamond wheel and tool manufacturers and other consumers of industrial diamonds are interested in the purchase of reclaimed diamonds. They may be contacted through regular trade channels. Inquiries regarding the program should be directed to the Salvage Division, National Production Authority, U. S. Department of Commerce, Washington 25.

Lagooning Purifies Metalworking

Controlled waste treatment process gives an effluent that meets stringent disposal requirements. Nontoxic wastes encountered in manufacture of automobile axles are typical

LAGOONING is being used successfully by Dana Corp. to treat nontoxic metalworking wastes at the company's Salisbury Axle Works outside Fort Wayne, Ind. Advantages of the process: Initial low cost, low operating cost, high efficiency and flexibility.

Details of the waste treatment method were given by C. R. Griffith, Salisbury's chief chemist, at the Sixth Industrial Waste Conference at Purdue University.

Treatment Process—All wastes, other than sanitary and storm wastes, flow by gravity through soap lines to the first detention basin. This flow will vary from 100 to 150 gpm while the factory is working. Calculated detention time in this basin with a flow of 200,000 gallons per day is about two days. During this period sedimentation takes place and a good part of the oil separates and floats to the surface. All insoluble oil and a good part of the emulsified oil is removed so the oil content of the first basin effluent averages 144 ppm. The influent has shown readings between 735 and 1800 ppm.

Effluent from the first basin discharges through a siphon into the second detention basin, which is a relatively level area of approximately 35 acres. About 15 acres are in actual use as a detention basin. A small earthen dike at the east edge retains the water in this lagoon. Its depth varies from a few inches to a maximum of 3 feet, and the level remains constant since a regular overflow, discharging to the creek, maintains a static head. Assuming an average depth of one foot, almost 5 million gallons of water are impounded. At a flow rate of 200,000 gallons per day this lagoon provides 25 days' detention.

Effluent from the lagoon passes into a small creek. During periods of low rainfall flow from the plant will furnish better than 50 per cent of the flow in the stream. This creek enters a city park about ½-mile below the plant, and then goes through a residential area before emptying into the river. All industrial wastes must be highly purified before discharging to the stream. Table II gives the efficiency of the second detention basin. A few tests run to determine overall reduction in potency of the raw wastes to the finished effluent indicate an initial average oil content of 1270 ppm, which compared to a final effluent of 7.1 ppm, gives a reduction totaling 99.4 per cent.

Oil Wastes Main Problem—In the absence of any quantity of highly toxic wastes at Salisbury Axle, soluble oil emulsions constitute the chief disposal problem because of the volume and nature of the waste. Approximately 3500 gallons of emulsifiable oils, or 180,000 gallons of emulsion, and 13,500 gallons of mineral oils are used per month. Except for normal losses, all of these materials eventually reach the disposal system. These waste oils are diluted by the other plant wastes. The soluble oil used in the plant is one of a group of eight in the same competitive price range which was chosen because of its stability. The need for a stable soluble oil emulsion is due in part to the use of hard water in some equipment. The high degree of stability of the product used has given no evidence of interfering with its disposal.

Every machine that uses cool-

TABLE I
PLANT WASTES AT SALISBURY PLANT

Type	Source
Soaps and alkaline cleaners	Washing operations
Acid cleaners	Cleaning tanks and surface treatment processes
Oils—Mineral	Equipment leaks, quenching, chip drainage
Oils—Emulsified	Cutting, grinding, etc.
Solvent emulsions	Cleaning operations
Paint	Spray booths
Boiler compounds	Boiler and water treatment
Other acid wastes	Coal pile drainage

TABLE II
EFFICIENCY OF SECOND DETENTION BASIN IN WASTE PURIFICATION—AVERAGE OF A 10-MONTH PERIOD

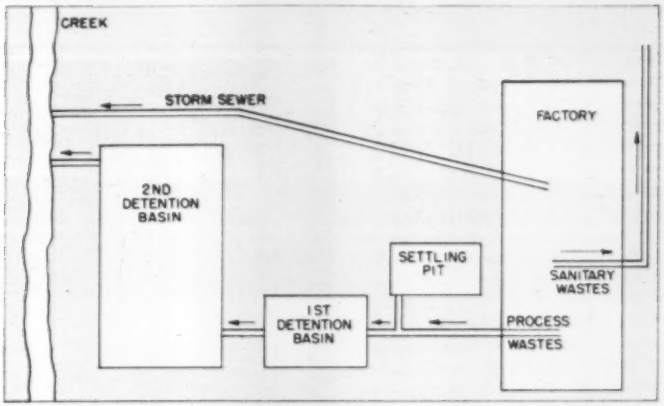
	2nd Basin Inf.	2nd Basin Eff.	% Reduction
Temperature ° F	81.3	59	
D.O. ppm	0.7	3.6	
% Saturation	8.6	35.2	
B.O.D.*—ppm	109.9	7.4	93.4
Color	White	Sl. Yellow	
Turbidity	40**	96.2**	
Odor	Oily-septic	Sl. Sulfide	
pH	7.03	7.43	
P—Alk.	0	0	
M—Alk.	145	163	
Settleable solids %	0.13	Trace	
Suspended solids ppm	112	19	83.1
Volatile solids ppm	80	6	
Oil ppm	144	7.1	95.2

* The biochemical oxygen demand (B.O.D.) is a widely used procedure to determine the concentration of polluting materials in waste waters.
** % Transmitted—Distilled water=100%. Measured on Photelometer.

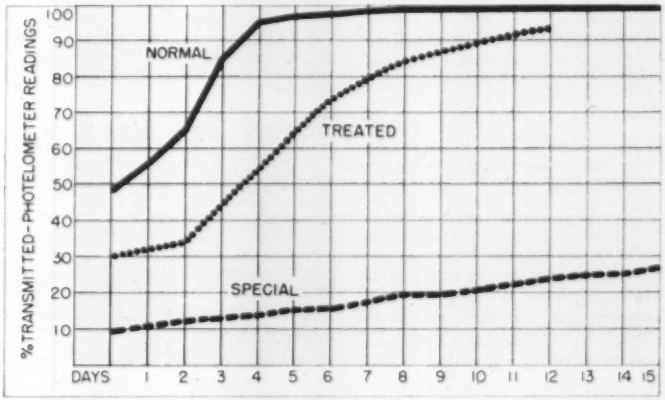
ant, cutting oil or water requires cleaning at regular intervals. At Salisbury Axle the contents of the machines are removed by hydroscavengers. These tanks on wheels, are pulled to the settling pit, where a series of settling chambers permits all sludge and heavy solids to settle in the first section. The supernatant from this section flows into a second section where additional settling takes place. This effluent then flows into a deep pit where the separated oil is collected by siphoning off the water beneath the oil layer. This treatment prevents approximately 1000 gallons of oil per month from reaching the first basin, and prevents the settleable solids from depositing in the sewers and first basin. Approximately 2 to 3 cu yd of solids per month are removed by this method.

Purification Mechanism — Lines to the first detention basin bring in alkali and soap wastes, acid rinse waters, alkaline emulsions, boiler treatment solids and floating oil. The pH of these incoming wastes is usually near 7.0, although occasionally it may fall to about 4.0, when an acid tank is drained for cleaning. However, detention time in this basin is usually sufficient to neutralize or dilute the acid so the effluent has never been checked below 6.6 or higher than 7.2. As these wastes pass through the system, a floc is formed which possibly consists of a complex tie-up of the iron dissolved in phosphoric acid with the alkaline wastes, soaps, and oils. Indications are that the iron may play an important part as a coagulant, but sufficient oils or soaps are present to make it buoyant.

Sedimentation Important—That sedimentation is important is proved by tests made in the Salisbury Axle laboratory to determine the effects of detention time. Plot of the relationship of time of detention to reduction of turbidity is



Flow diagram of metalworking plant waste layout at the Salisbury Axle Works



Curves showing reduction of turbidity of wastes by detention in lagoon treatment. Solid line is an average curve for normal wastes; broken line represents discharge of emulsion cleaner; dotted line shows improved results when above cleaner was discharged at same time acid wastes were dumped

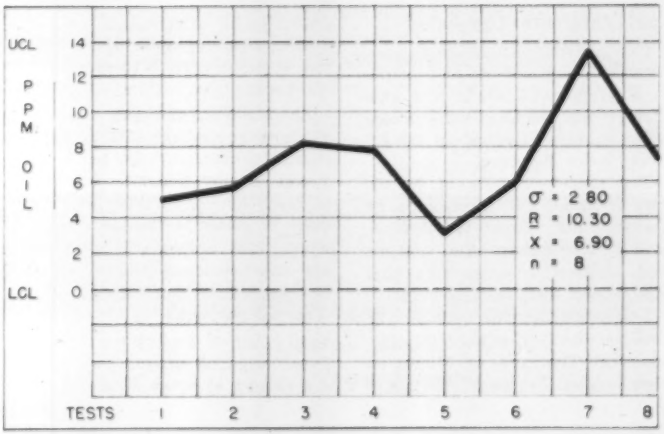


Chart showing oil content of second detention basin effluent from a statistical standpoint. Treatment confines all variables within control limits

given in one of the illustrations. The solid line represents what is considered to be an average curve, showing how the normal wastes are clarified. From this curve it can be seen that the second basin has more than sufficient detention time to clarify the wastes. Broken line represents one sample taken at the time of discharge of a highly concentrated emulsion cleaner. This material is the only one found which did not appear to break down satisfactorily with normal treatment. However, at a later date when this material was discharged to the sewer system, some acid wastes were dumped at the same time, and the curve followed the pattern of the normal waste.

This indicates that material selection may be important in maintaining a balanced system. If a material difficult to break down must be used, it may require additional chemical treatment before it reaches the first basin.

Algae and other plant and animal life probably are involved in the purification process, but not to the extent that the loss of algae, as for instance during the winter months, greatly reduces the efficiency.

Temperature variations do not seem to affect purification, as consistent reduction is shown through all seasons. Year-round operation is permitted in a section of the country that has a wide variation between maximum and minimum temperatures.

Coal Conferences Completed

Two international scientific conferences completed recently in the U. S. promise to benefit both this country and European nations represented, says Secretary of the Interior Oscar Chapman.

The secretary referred to the first International Conference on Underground Coal Gasification, held at Birmingham, Ala., and the coal gasification symposium that met subsequently in New York.

Latter session was held in connection with the annual meeting, American Institute of Mining & Metallurgical Engineers. Bureau of Mines assisted in arranging both sessions, the first with Alabama Power Co. and the second with the AIME's Coal Division.

Caterpillar Diesel Traxcavator bites off a big chunk of solidified slag and loosened brick as it makes short shrift of the backbreaking pocket cleaning job. When Crucible Steel Co. of America shifted to tractors from hand labor on this work at the Midland, Pa., plant, it cut five days from furnace down time and saved about 3300 manhours. Machines empty the pockets in 64 hours

Tractors Slash Slag Pocket Cleanup Time

MACHINES that replace pick and shovel gangs save Crucible Steel Co. of America about five days' furnace operating time in open-hearth slag pocket cleaning operations at the Midland, Pa., plant. Track-type tractor used for the speeded cleanup is the Caterpillar diesel Traxcavator.

Need for slag removal results from overflow that runs off into ladles under the furnace. From there, a small percentage proceeds into two brickwork pockets, one under each end of the furnace, where it solidifies. The pockets gradually fill until run-off reaches a point near the top of baffle walls that separate pockets from preheat checkerwork.

At Midland, the job involves handling an average 2750 cu ft of slag, plus other furnace debris. It means moving material weighing as much as 800 to 1000 tons. In cases of complete furnace rebuild, where roof arches and sidewalls are also removed and replaced, this figure goes much higher.

When the work was done by hand labor it took three 20-man crews, working around the clock, a minimum of seven days. In addition to furnace downtime, this tied up a total of 3300 manhours. The same pockets are freed from debris by the Traxcavators in two 16-hour days or a total of 64 tractor hours.

During the furnace shutdown period, tractors dig the solidified slag out of the filled run-off pockets and haul away roof brick knocked loose for rebuiding. Other work done at this time may include removing and replacing several feet of preheat checkerwork, replacing flame port brickwork, baffle walls and hangerskulls.

Machines' versatility makes them useful not only for digging out pockets but they can be kept working almost full time cleaning up spills and splashes around ladles and under the furnace. They can also aid plant construction and maintenance and provide power for many lifting, digging, dozing and winch jobs.

Plans Process Control Work

Development and testing process control systems will be a major function of the control and research laboratory being completed at Orrville, O., by Hagan Corp., Pittsburgh. Apparatus for frequency-response testing all kinds of control system components and instruments will be perfected, says D. J. Erickson, president. The laboratory is a one-story building built adjacent to the company's Orrville manufacturing and assembly plant.

BUSINESS IN MOTION

To our Colleagues in American Business . . .

For several years this space has been used to tell how Revere has collaborated with its customers, to mutual benefit. Now we want to talk about the way our customers can help us, again to mutual benefit. The subject is scrap. This is so important that a goodly number of Revere men, salesmen and others, have been assigned to urge customers to ship back to our mills the scrap generated from our mill products, such as sheet and strip, rod and bar, tube, plate, and so on. Probably few people realize it, but the copper and brass industry obtains about 30% of its metal requirements from scrap. In these days when copper is in such short supply, the importance of adequate supplies of scrap is greater than ever. We need scrap, our industry needs scrap, our country needs it promptly.

Scrap comes from many different sources, and in varying amounts. A company making screw-machine products may find that the finished parts weigh only about 50% as much as the original bar or rod. The turnings are valuable, and should be sold back to the mill. Firms who stamp parts out of strip have been materially helped in many cases by the Revere Technical Advisory Service, which delights in working out specifications as to dimensions in order to minimize the weight of trimmings; nevertheless, such manufacturing operations inevitably produce scrap. Revere needs it. Only by obtaining scrap can Revere, along with the other companies in the copper and brass business, do the utmost possible in filling orders. You see, scrap helps us help you.

In seeking copper and brass scrap we cannot appeal to the general public, nor, for that matter, to the small businesses, important though they are, which have only a few hundred pounds or so to dispose of at a time. Scrap in small amounts is taken by dealers, who perform a valuable service in collecting and sorting it, and making it available in large quantities to the mills. Revere, which ships large tonnages of mill products to important manufacturers, seeks from them in return the scrap that is generated, which runs into big figures of segregated or classified scrap, ready to be melted down and processed so that more tons of finished mill products can be provided.

So Revere, in your own interest, urges you to give some extra thought to the matter of scrap. The more you can help us in this respect, the more we can help you. When a Revere salesman calls and inquires about scrap, may we ask you to give him your cooperation? In fact, we would like to say that it would be in your own interest to give special thought at this time to all kinds of scrap. No matter what materials you buy, the chances are that some portions of them, whether trimmings or rejects, do not find their way into your finished products. Let's all see that everything that can be re-used or re-processed is turned back quickly into the appropriate channels and thus returned to our national sources of supply, for the protection of us all.

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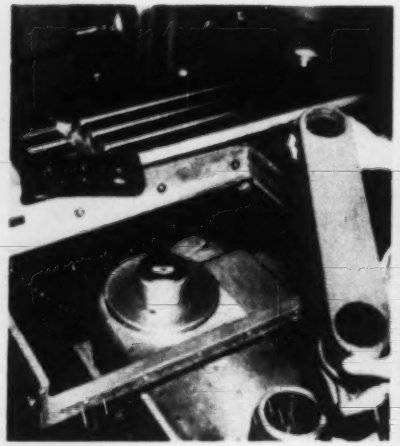
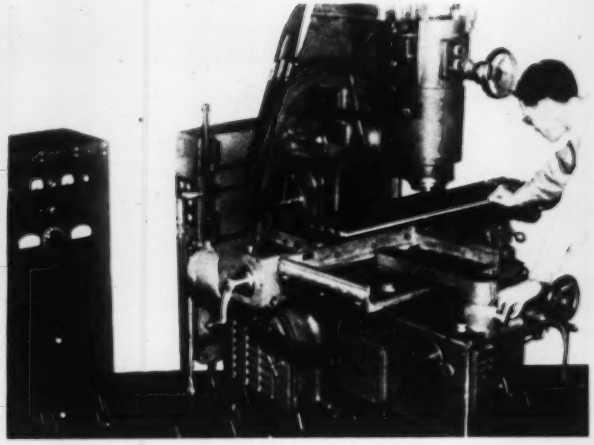


Light tunnel arm is removed exposing shutter head below transparent pattern table. Pattern is at left



View of copy milling machine shows housing containing photocell, amplifier, synchronous motor and arc light

Electric Eye Keeps Copy Milling on Precision Beam

Feed rates up to 100 inches per minute can be obtained with this edge-follower milling machine which uses an electric eye to engage its guiding pattern

AUTOMATIC copy contour milling machine made by Kearney & Trecker Corp., Milwaukee, is a refinement of the tracer unit, first reported in STEEL (May 28, 1951), originally developed for application to No. 2 model CH and No. 3 model CK machines. Machine, described at Westinghouse's 16th Annual Machine Tool Electrification Forum, by Theodore A. Wetzel, supervisor of development engineering, is more than a copy contour attachment. The entire knee-type milling machine design is modified to suit requirements for copy milling work.

Two models are available: One with high cycle cutter spindle heads and rapid feed rates for nonferrous; the other with lower spindle speeds and feed rates for ferrous metals. To provide maximum versatility and usefulness, standard milling machine features are available in the copy machine. In the interests of preserving accuracy, company does not recommend doing heavy duty work normally done on standard milling machines.

Electronic Scanning — Machine works from an optical type opaque pattern. Workpiece produced is not a replica of the pattern employed. A male workpiece is produced from a female pattern and a female workpiece from a male pattern. Optical type pickup permits use of easily stored paper pattern and its sensitivity aids in sensing changes in pattern contour in advance of arriving at the point of change.

When pattern masks the light source, manual switch can be used to feed the pattern into engagement with the shutter which spins below the pattern table. Then automatic copy feed takes over and commences the copy operation. At this time the spindle may be fed downwardly until full engagement is made with the workpiece. The workpiece is completed when the machine has fed the pattern through on 360-degree traverse. Cutter can then be fed upward.

Switch used to start and stop copy operation is a light mask which when turned into light path prevents arc-light rays from reaching first collimating lens. When machine is used as a standard milling machine, transparent pattern table is removed from the work table.

Three sets of change gears establish proper range for copy feed rates, which extend to a maximum of 100 inches per minute. Eight standard milling spindle speeds from 200 to 1500 rpm are available. For high range of 3600 or 7200 rpm a spindle speed selector switch is provided.

Miniaturization Progress Aired

Recent advances in the program to reduce size of electronic components and equipments, particularly for the military, will be discussed at a symposium May 5-7 in Washington. The three-day session, "Symposium on Progress in Quality Electronics Components," is sponsored jointly by American Institute of Electrical Engineers, Institute of Radio Engineers and Radio-Television Manufacturers Association.

The technical review has active support of both Dept. of Defense and National Bureau of Standards. J. G. Reid, Jr. of the latter body is symposium committee chairman. Program is directed by A. F. Murray.

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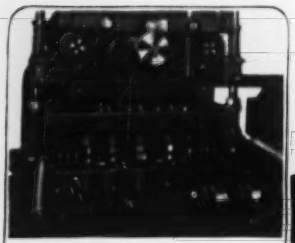
The NEW THOMAS Plate Duplicator

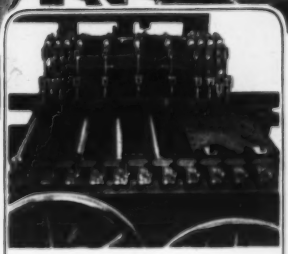
with new simplified controls

Punches Plates without Layout

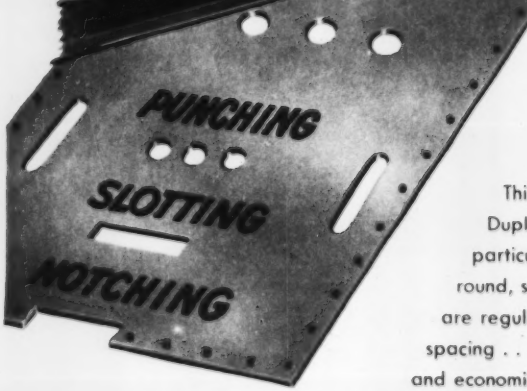


Punching tools include eleven stations, independently controlled . . . 6 up to 1⅛" dia., one each up to 2" dia., 3" dia., 4¼" dia., 3" square, and 6¼" dia.

Illustrated is 150-ton capacity punch, with eleven different tools. Table handles plates up to 51" x 12 ft.



Operator's station, showing templet and eleven air-electric control switches and locator pins.



This is but one of many NEW Thomas Plate Duplicators specifically engineered to perform your particular plate punching jobs. Whether you call for round, square, oblong or slotted holes; whether plates are regular or odd-shaped . . . and regardless of hole-spacing . . . this modern duplicator will give you accurate and economical punching . . . *without layout.*

Write us your requirements and we will recommend proper size and tooling.

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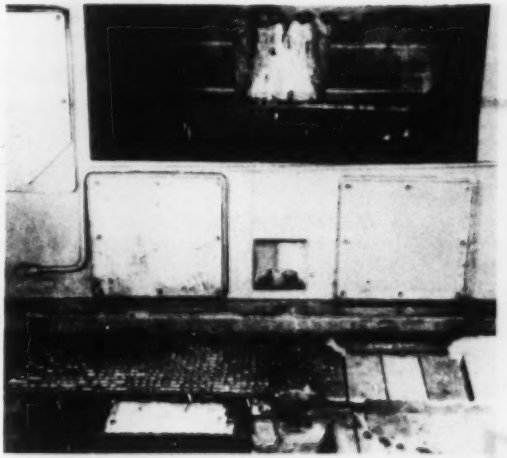
31

Dry chips drop from end of oscillating conveyor into skit bucket. Photo at right shows wet chip removal,



water and chips flow from base of machine into oscillating conveyor that runs under floor. (Floor plate removed here)

CHIPS DO DISAPPEARING ACT—

Automatic, Under Floor System Removes Them

Oscillating conveyors whisk wet and dry chips away from machines to central collecting points. Chips are automatically pressed into briquettes, then returned to foundry

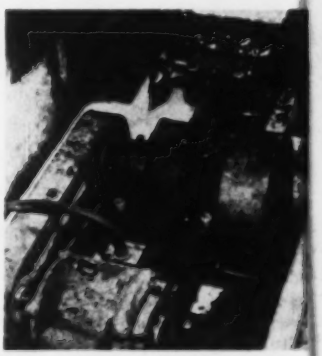
PRIME example of automation, theme of Ford Motor Co.'s Cleveland engine plant is the automatic chip removal system.

Both wet and dry chips are handled by the system which processes them automatically from the machine to central collection points. Procedure varies for the type of chip.

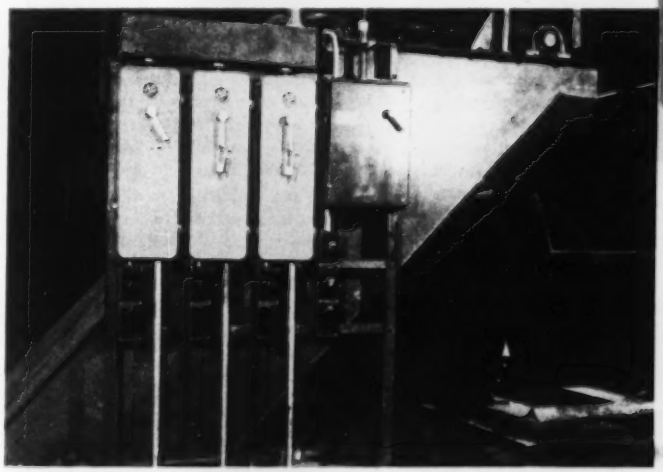
Dry chips fall from machines into a steel trough 8 inches wide, 3 inches deep extending the length of the machine. One end of trough is slightly lower than the other. A vibrating motion bounces chips down to the lower end where they tumble onto a vibrating conveyor, part of the system that runs under the floor and serves all areas of the plant.

From the conveyors, chips drop into elevating hoppers. Electric eyes signal when the hoppers are filled and the metal is trucked in tubs to be automatically made into 5-inch diameter briquettes that are returned to the foundry.

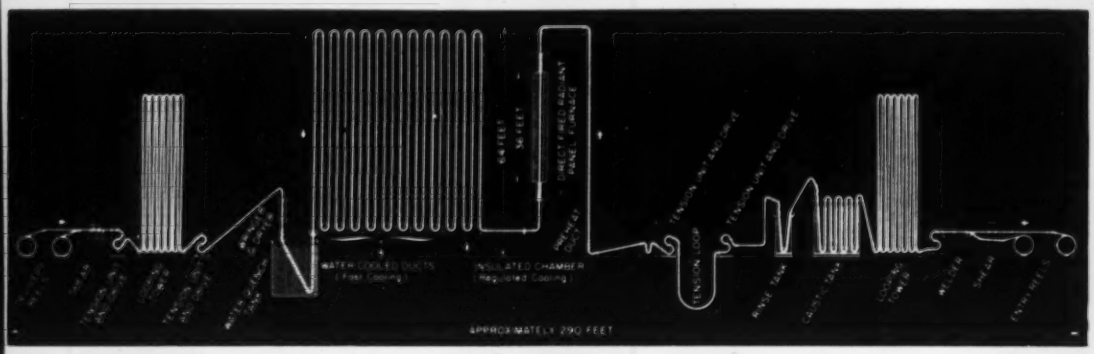
Similar oscillating conveyors move wet chips along with cooling water. Chips are conveyed to central settling pits. They are conveyed out of the pit automatically, discharged into tote carts for transportation to the automatic briquette pressing operation.



The power drive of wet chip conveyor



Discharge end of wet chip removal unit in central coolant system. Chips will be automatically pressed into briquettes which go back to the foundry



Typical alignment of equipment in a high-speed annealing line utilizing direct-fired radiant gas heating equipment. Flow of strip is from right to left. Uniform temperature of the radiating burner cup surfaces is controllable from 1300 to 3100°F by fuel input regulation. Annealing can be a 90 second process with the strip moving up to 1000 fpm

Annealing Accelerated with Radiant Heat

Continuous annealing shows increases in rate of production and quality of product. Strip can be run at the rate of 1000 fpm in direct-fired radiant gas heating equipment

CHARLES A. TURNER JR.
Metallurgist
Selas Corp. of America
Philadelphia

DEVELOPMENT and adoption of high-speed continuous annealing of tin plate has revealed new and advantageous potentials for the modern strip mill. Presently continuous annealing may utilize electrical or gas equipment for heating. Electricity has economic limitations which, to date, have restricted application to production lines operating at speeds lower than 300 fpm. Gas heating may be indirect, using radiant tubes, or direct-fired, with radiant refractory panels.

Continuous annealing in direct-fired radiant gas heating equipment can be a 90-second process from preheat to cooling, with the strip moving at 1000 fpm. Uniform physical properties with improved drawability of the continuous annealed strip result in a universal temper designated as temper TU, applicable where T1 to T4 are conventionally specified.

Low carbon steel for tin plate is composed principally of ferrite which is quite soft and cementite (iron carbide) which is hard. Cementite is nearly always present as discrete carbide particles varying in size, shape and distribution. Microstructure and the physical properties are determined by those factors which influence size and shape of the ferrite grains, and the type and distribution of the carbide particles. Primary purpose of annealing low carbon steel for tin plate is to remove the strain hardening and embrittlement induced by cold reduction of the steel to the desired strip thickness. Substantially all of the softening, in this case, occurs by the process of recrystallization wherein newly formed grains of ferrite replace the distorted, cold worked grains.

No Austenite — Since this annealing is carried out below the lower critical transformation temperature, no austenite is formed. However, a portion of the carbides may be altered from their original form and distribution because ferrite is capable of dissolving approximately 0.03 per cent carbon at 1335°F. The cooling rate from annealing temperature will influence the ultimate hardness depending upon the temperature at which precipitation of this dissolved carbon takes place.

Time the material is above the recrystallization temperature in the continuous process is short, producing a relatively fine-grained structure. Cooling rate is fast producing a fine, random distribution of the carbides dissolved in ferrite during heating and precipitated during cooling.

Continuous annealing in direct-fired radiant gas equipment is a rapid heating process involving seconds to reach annealing temperature. No soaking is required since the strip, heated in one vertical pass, is at a uniform temperature leaving the furnace zone. Pilot line tests have demonstrated that any soaking time, within the practical limits of a high-speed continuous line, fails to produce any apparent further improvement in physical properties.

Controlled Cooling—Cooling rate is controlled to provide time for the carbon dissolved in ferrite to precipitate above 800°F, avoiding the trapped solid solution which, at room temperature, will result in age hardening. Below 800°F the strip may be cooled at any rate.

Shorter cooling cycles obtained

PROGRESS REPORTS FAVOR EXTENDED USE OF NATIONAL CARBON IN BLAST FURNACES

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Test it and . . . you always buy it!

● The future of "National" carbon as a preferred material for blast furnace linings is definitely assured by the mounting evidence of its extra long life in hearths and, more recently, in side walls all the way up to the mantle.

Already, indications are that, as carbon goes *up* the furnace, operating costs come *down*. Fewer shut-downs, more uniform casts are consistently being obtained in existing installations. And increased capacity can be expected to result from the use of thinner wall sections, made possible by this ideal furnace-lining material.

Furnace operators are urged to keep their eyes on carbon and on the growing body of data covering its use in modern, high-tonnage-life furnaces.

OTHER NATIONAL CARBON PRODUCTS

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in a pilot line for continuous annealing at speeds to 150 fpm showed no aging in the strip. In one case, a chamber at room temperature cooled the strip from annealing temperature to 800°F in about 17 seconds. In another case, the strip was cooled to 750°F in 40 seconds. The hardness after both cycles was identical to that obtained in the production cycle at 650 fpm, and did not change when this strip was given an accelerated aging test by immersion heating to 600°F for one minute.

Improved drawability of the continuous-annealed product, it appears reasonable to conclude, lies in the fine, uniform distribution of the carbides affected through solid solution in heating and precipitation in the temperature range from 800 to 1000°F during cooling. Certainly, the fine grain size has little influence on drawability.

Carbide-distribution assumption is strengthened by considering that the rapid annealed material exhibits more uniform elongation throughout the entire gage length under tensile test. In other words, the uniformly distributed fine carbides spread their strengthening effect over the full stressed area to minimize the localized yielding or flow of the ferrite in deep drawing. This localized yielding is a cause of cracking through excessive cold working. Also this accounts for the limitations of the material when localized stretching is required, as in extruding or dimpling.

Drawability Shown—Continuous-annealed tin plate after being subjected to the indicated heating-cooling cycles will show a hardness in the range of R_{30}53 to 58, varying according to chemistry, melting practice and hot mill practice. The product would fall into either the T3 or T4 specification, based on batch annealed strip. However, a high degree of drawability has been demonstrated by the TU temper continuous-annealed strip applied to production of medium-draw and deep-draw parts, for which T2 or T1 tempers were previously specified. Also, the product shows elimination of dog-earing, or the tendency to flow irregularly in deep draws.

Anneal border, the shaded area having a stained or etched appearance extending about 4 inches from both edges, has been eliminated in continuous-annealed strip. Anneal border is associated with the infiltration and reaction of the protective gas atmosphere. The corrosion resistance of the anneal border is well below the resistance of the area that is further from the edge. Extremely short exposure of the strip to atmosphere at elevated temperatures during continuous annealing results in a uniformly good corrosion resistance, from edge to edge. The elimination of stickers provides an advantageous surface improvement.

Interior view of direct-fired radiant panel furnace looking down to the seal rolls. Panels are open for inspection

Successful application of continuous annealing at speeds higher than 600 fpm depends on high-speed heat transfer. Direct-fired radiant gas method provides the required heat transfer rate through a high temperature gradient that maintains the furnace temperature substantially above the anticipated peak strip temperature.

Vertical Panels—Furnace is constructed as two vertical heating panels. In the closed position the panels form the combustion chamber, sealed against air infiltration. This is safeguarded by the constant maintenance of a positive pressure from the combustion gases. Responding to control devices, the panels open horizontally to prevent strip burning due to line stoppage. Uniform temperature of the incandescent radiation burner cup surfaces is controllable from 1300 to 3100°F by fuel input regulation. Gas and air is premixed in controlled ratio and pressurized before entering the burners.

In direct-fired radiant gas annealing equipment, the gas-air mixture is maintained with a slight deficiency of air to avoid the presence of free oxygen in the products of combustion. Carbon dioxide and water vapor in these furnace gases are partially offset by the presence of the reducing components, carbon monoxide and hydrogen. Tin plate is annealed continuously at 1300°F without forming a surface oxide in this controlled atmosphere in 3.5 seconds.

Heating is essentially radiant but the substantial convection effect of the hot gases is not ignored. Waste gases are carried from the top of the furnace through a preheating duct. At the higher speeds, where the preheat is used to raise the strip to 400°F entering the furnace zone, heating efficiencies of 33 per cent have been attained.

Varying strip widths are heated uniformly in direct-fired radiant gas annealing equipment by heat input control through vertical burner manifolding which permits cutting off the outside burner rows when necessary.

Oxidation is prevented during cooling by maintaining a reducing atmosphere in the cooling ducts, and precipitation of the dissolved carbides above 800°F is accomplished through regulation of the cooling rate. Cooling above 800°F is in an insulated chamber; below 800°F in water cooled ducts.

Strip leaving the cooling ducts at approximately 300°F is water quenched to 180°F and dried. Further cooling to 125°F takes place in travel through the looping tower before coiling. This final cooling permits temper rolling to be applied directly after annealing.

Bright Strip—Palm oil, a lubricant remaining on the strip from the cold reduction operation, can be removed completely, without washing, during continuous annealing. Unwashed strip annealed in

Taylor Sillimanite-Fortified (Tasil-F) refractories*—widely used in the glass and metallurgical industries for those critical furnace areas subjected to batch carry over or fluxes at high temperatures—are fortified with ALCOA Alumina.

This photo shows the excellent condition of Taylor Sillimanite-Fortified (with ALCOA Alumina) brick and burner block in the back port of a cross-fired continuous glass container tank. After 276 operating days, the Tasil-Fortified (Tasil-F) brick extended 2½" to 3" beyond the adjacent super-duty fire clay brick. Note also that the burner opening or throat changed very little in either shape or dimension. This tank melted alternately flint and opal glasses at approximately 2700°-2750° F. for a total of 78 days on flint, 198 on opal. Total combined production was 11,131 tons consisting of 8,251 tons opal and 2,880 tons flint.

Bricks and shapes fortified with ALCOA Alumina are outstanding for high hot load strength and volume stability at temperatures above 2900° F. Their higher operating efficiency for the entire life of the refractory actually makes them the most economical to buy.

We do not make refractories, but we will gladly refer you to reliable sources. Write to: ALUMINUM COMPANY OF AMERICA, CHEMICALS DIVISION, 622D Gulf Building, Pittsburgh 19, Pennsylvania.

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without **BREAKING**

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DUCTALLOY can be cast in intricate shapes with fine surfaces, close tolerances and less machining stock than cast steel because of its high fluidity. It is particularly valuable for pressure castings... and DUCTALLOY can be welded to steel, to gray iron and to DUCTALLOY. Write for information about this economically important new material to:

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pilot line tests had clean and bright surfaces without deposit or residue, and responded normally to subsequent tinning and corrosion testing.

Present practice in continuous annealing includes the washing stage as an integral part of the annealing line. Immersion of the strip in a caustic solution of sodium orthosilicate at 180°F is followed by a 180°F water rinse and hot air drying. Then the clean and bright strip enters the preheating duct and furnace.

Removal of palm oil film by exposure to high temperature radiant heat for expulsion with the products of combustion is an anticipated feature of future continuous annealing equipment, with consequent improvement in heating efficiency due to the altered surface emissivity, as well as the cost savings in washing equipment, floor space and operation.

Manganese Ore Tests Reported

Results of tests to determine whether manganese ore from four properties in San Bernardino County, Calif., can be concentrated by ore dressing methods are released by Bureau of Mines, U. S. Dept. of Interior. Tests were made as a part of the bureau's efforts to find methods for using the low-grade domestic manganese ores.

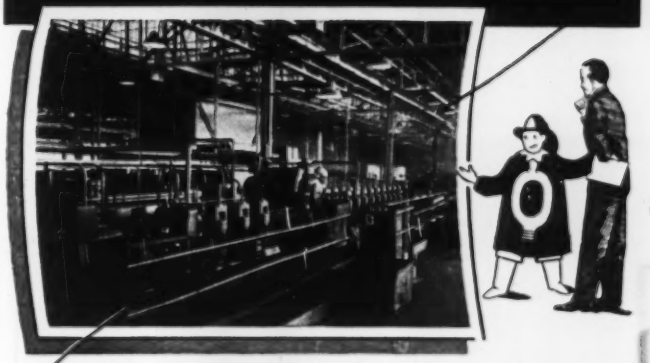
Data shows ore from two properties yielded concentrates, which, when sintered, contained 70-80 per cent and 65-77 per cent respectively of the manganese in the ore. Ore from the other properties yielded low recoveries. Copy of the investigations can be obtained free from the bureau's publications distribution section, 4800 Forbes St., Pittsburgh 13.

Plate Heaters Up Btu Capacity

Desired Btu transfer can be obtained with a unit about half the size needed using conventional methods. So says the manufacturer, Kold-Hold Mfg. Co., Lansing, Mich. The firm's unit, called Platecoil, has a reported Btu capacity per square foot that is more than double that of pipe coil.

The firm says Platecoils take less steel because heating solution flows in channels formed by joining two embossed surface plates. This con-

Today's high replacement costs
emphasize the need for



"Automatic" Sprinkler
10-point FIRE PROTECTION

Take a look at your production equipment. Some machines have probably had their original cost written off by many years of service. Others may be only a few years old and still others practically new. Yet *all* of them are vital to your operation.

Have you ever considered how much it would cost to replace them with all new equipment at *today's high prices?*

Of course they're insured. And if your company is alert, you try to keep insurance coverage up to value. But are you informed daily of every price rise on every piece of equipment you own? Have you figured installation costs at today's high labor rates? Are you sure that replacement equipment is obtainable on short notice *at any price?*

The more you think about it, the more you'll agree that it's far better to prevent the destruction of vital equipment than to face the prospect of replacing it at many times its original cost. *"Automatic" Sprinkler 10-Point Fire Protection* is designed, engineered and manufactured specifically for you to do just that!

Write today for our factual book
"The ABC of Fire Protection"

"AUTOMATIC" SPRINKLER CORPORATION OF AMERICA
YOUNGSTOWN 1, OHIO
OFFICES IN PRINCIPAL CITIES OF NORTH AND SOUTH AMERICA

"Automatic" Sprinkler
FIRST IN FIRE PROTECTION

BIGGEST NEWS IN '52...

"A SIZE FOR EVERY NEED"

HYDRAULICALLY BALANCED DESIGN — Reduces wear, improves operation, prolongs life of unit.

FOUR SIZES — Plus interchangeable cam rings for a variety of pump or motor capacities.

CONVERTIBLE — Ready for either pump or motor applications without alterations of any kind.

NEW HIGHLY COMPACT DESIGN — Rugged heavy-duty construction gives the Pump/Motor plenty of stamina for long, hard, continuous duty at 2000 psi. Only three major components.

INTERCHANGEABLE CAM RINGS — Range of capacities as pump or motor thru interchangeable cam rings.

BI-DIRECTIONAL ROTATION — Adjustable for either clockwise or counter-clockwise operation.

WIDEST ADAPTABILITY — Porting location and direction of rotation adjustable to eight different combinations.

THE DENISON ENGINEERING COMPANY, 1163 Dublin Road, Columbus 16, Ohio

DENISON PUMP MOTOR

New Dual-Purpose Vane-Type Unit for 2000 psi Continuous Duty

2½ to 70 gpm deliveries as a pump, or torque ratings of 12 to 257 inch-pounds per 100 psi, as a motor

Denison scores a new achievement in dual-purpose pump design. This all-new, vane-type power package is built for *continuous duty* at 2000 psi — and is ready for either pump or motor applications without alterations of any kind! Four sizes are available, with optional cam ring assemblies that permit eleven models, for different pump-volume or motor-torque capacities. Complete hydraulic balance assures longer life through reduced wear. New single stage design and many other features add to the outstanding dual-purpose adaptability of this new Pump Motor! *Write for Bulletin P-5. The Denison Engineering Co., 1163 Dublin Road, Columbus 16, Ohio.*

STANDARDIZE ON SIMPLICITY

Only 3 Major Components

OUTBOARD PORT HOUSING

PUMPING CARTRIDGE

INBOARD PORT HOUSING

DENISON Hydr-Oil-ics

PUMP MOTOR

"The Finest Money Can Buy!"

Designed for Speed • Precision • Compactness

The

AIR CYLINDER

with the *Built-in Valve*

Air engineers agree: the closer the valve to the cylinder, the more efficient is air cylinder operation. In the Bellows Air Motor the valve, and all operating controls, are an integral part of the cylinder itself.

This built-in construction means quicker action, more positive response, surer control, and more economical operation. Built-in construction means compactness, simplified installation, minimum maintenance.

The Bellows Air Motor is made in five bore sizes: 1¼", 1¾", 2½", 3⅜" and 4½", and in any stroke length, with either the built-in Electroaire Valve* for remote control electrical operation, or with the built-in manual valve for hand and foot operation or for mechanical linkage to a machine element. Wide range of mounting styles.

Write Today for this free 32-page booklet. Dimensional specifications, technical data, wiring diagrams, case history studies, production and cost data. Address: Dept. ST 452, The Bellows Co., Akron 9, Ohio. Ask for Bulletin CL-30.

The Bellows Co.
ESTABLISHED 1911
AKRON 9, OHIO

FOR FASTER, SAFER, BETTER PRODUCTION

struction should give a plate-type unit more prime heating surface in a given area. Because no welding or pipe fitting is necessary, installation can be done rapidly by two men through use of quick-change hangers. When maintenance is required, units are removed and replaced in several minutes without dumping tank contents.

Complete information on the plate-type product is available in a new 6-page bulletin. Copies will be sent free on request to the company.

Standard Set for Chrome Ore

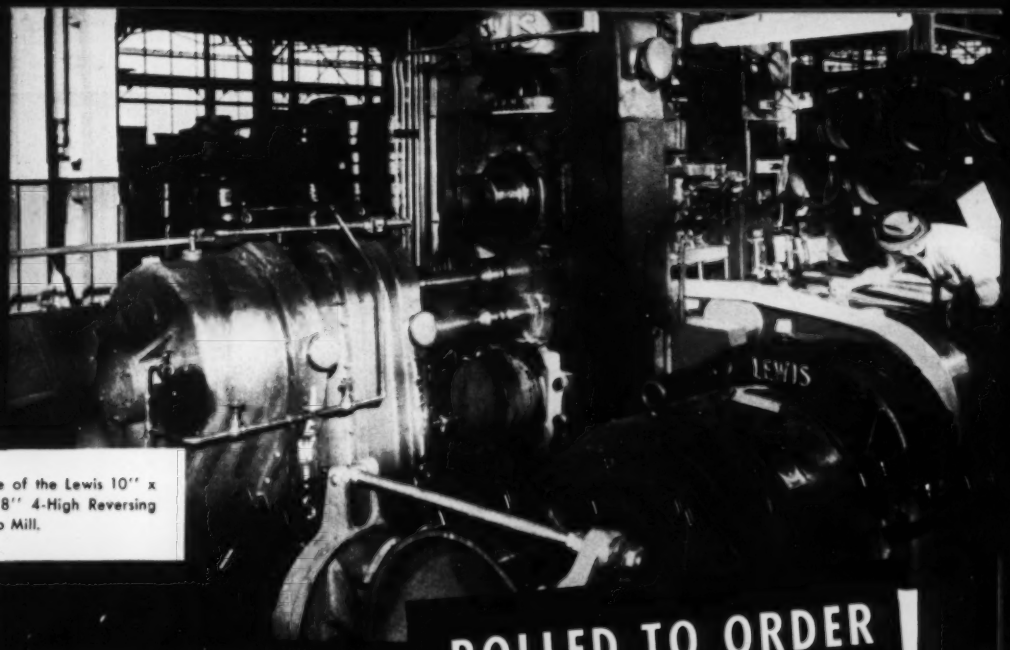
Industry standard sample for metallurgical chrome ore has been established through a co-operative study by several metallurgical, commercial and chemical laboratories experienced in chrome ore analysis. Laboratories participating were from the U. S., Canada and Union of South Africa.

Analysis of the ore, containing 50.96 per cent Cr_2O_3, for chromic oxide, iron, silica, alumina and magnesia fills an industry need for a reference standard having chromic oxide content higher than that of the chrome refractory containing 36.97 per cent Cr_2O_3 now obtainable from National Bureau of Standards. Portions of the sample and copies of the analysis certificate are available without charge to industrial and commercial laboratories directly concerned with chrome ore analysis, upon application to Merton H. Davey, Andrew S. McCreath & Son, Harrisburg, Pa.

Details of the sample preparation and a general review of current analytical procedures and results on chrome ore are also published. This paper is prepared for publication by Winslow H. Hartford, research supervisor, Mutual Chemical Co. of America, 270 Madison Ave., New York 16.

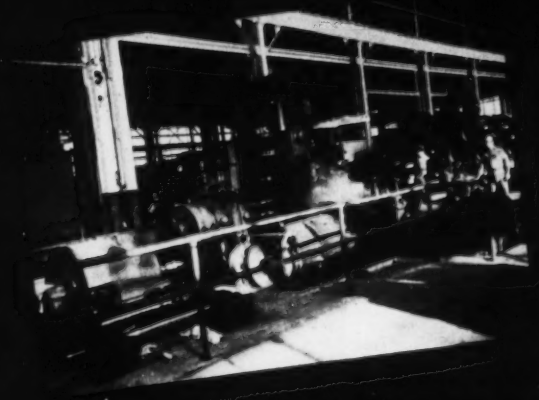
Water Data Book Revised

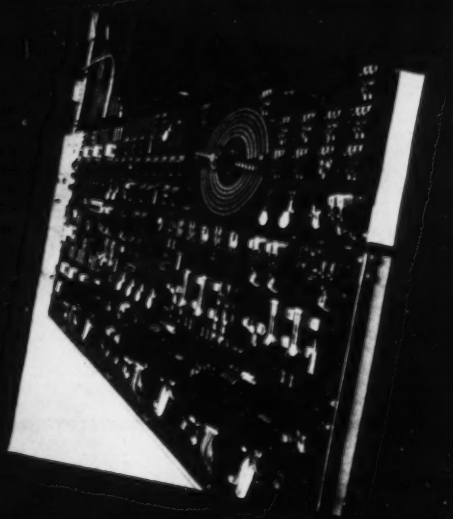
Enlarged edition of its water data book is announced by Permutit Co., New York. Superseding an earlier volume published in 1949, the practical reference presents a compilation of 77 tables. Subjects covered include: Hydraulics, impurities in water, chemical conversions, saturated steam,



Entry side of the Lewis 10" x 20" x 28" 4-High Reversing Cold Strip Mill.

ROLLED TO ORDER -to Your Specifications





When Production Steel Coil Co. Inc. gets a request for cold rolled strip of unusual width, gauge, temper and finish, they don't put the customer off with a "not in stock" excuse. They roll the order to exact specifications right in their Detroit warehouse on a Lewis 10" x 20" x 28" 4-High Reversing Cold Strip Mill! Reversing coils permit continuous operation with substantial reductions per pass, and close gauge tolerances are maintained with the most advanced pushbutton controls. This mill, together with its annealing equipment provides an exceedingly flexible arrangement that meets all customers' requirements. Write for complete technical details.

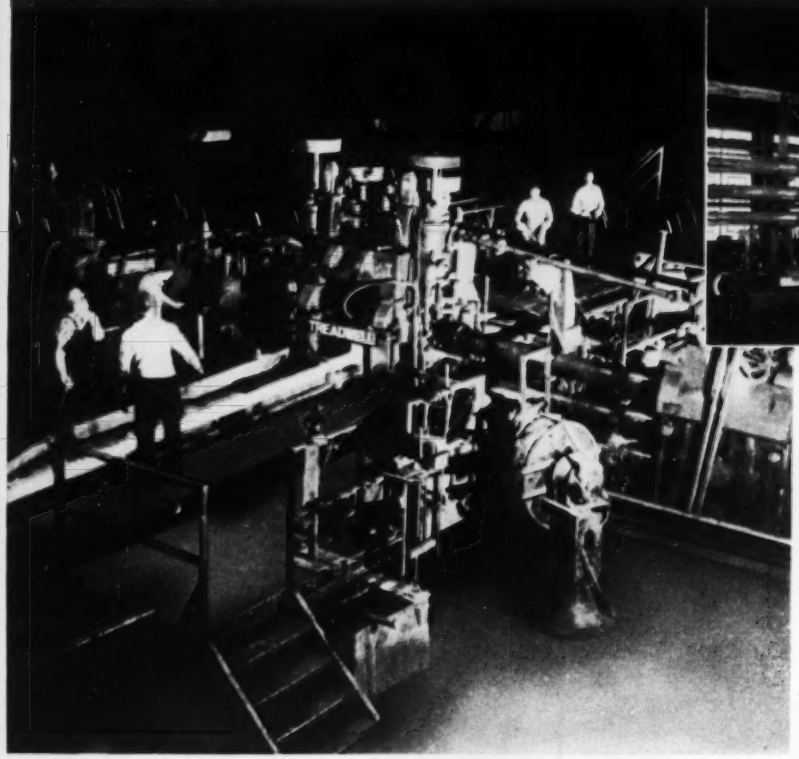
Manufacturers of Rolls and Rolling Mill Equipment For the Iron, Steel and Non-Ferrous Industries

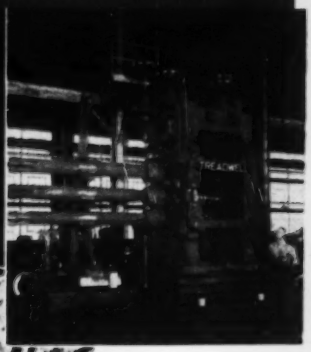
FOUNDRY & MACHINE

Division of Blaw-Knox Company

Pittsburgh, Pa.

Treadwell





Shop view of the roll stand with spindles

Manipulators, Mill, etc.
Mills, Blooming & Billet
Mills, Merchant & Bar
Mills, Rod
Mills, Sheet
Mills, Strip (Cold)
Mills, Strip (Hot) & Skelp
Mills, Vertical Edging
Tables, Mill
Tables, Tilting & Lift
Tables, Transfer
Transfers

Coilers & Reels
Conveyors, Coil
Drives
Ejectors, Furnace
Gauges, Shear, Saw, etc.

Beds, Cooling
Beds, Inspection
Bumpers, Furnace

Pushers, Furnace
Repeaters

Handling Equipment (Kick-offs, Pilers, Cradles, etc.)

Steel and Iron Castings
Ni-Hard and Ductile Iron Castings

Three-High Mill for rolling precision rounds and squares up to and including 5" round or square. The mill is equipped with motor operated screw-downs for both top and bottom rolls.

Treadwell Engineering Company

EASTON, PA.

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WOrth 4-3344

1217 FARMERS BANK BLDG.
PITTSBURGH 22, PA.
ATlantic 1-2883

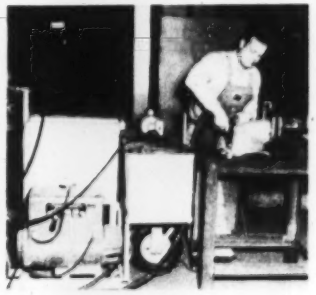
boiler feedwater makeup requirements, chemicals used in water treatment, alkalinity relationships, specific gravity and chemical reactions.

Revised volume, 5 x 7¼-inch size, contains 116 pages. Requests from engineers or those who work with water conditioning problems should go to the company, 330 W. 42nd St., New York 36.

Cart Gives On-the-Spot Welding

Spot welding is done with a mobile unit at Ryan Aeronautical Co., San Diego, Calif. Linde Heliarc spot welding gun is mounted with necessary facilities on a mobile unit. Package can be rolled to any production point and placed in operation within a matter of minutes.

Unit incorporates a timing control, dc generator, argon gas supply and 40-gallon water tank and pump. Operation of the equipment is completely automatic from the time the operator presses the trigger. Many sheet metal and machined members are welded in their assembly jigs and need not be moved to welding machines.



WELDER ON THE WAGON
. . . unit is wheeled to the job

Guide Outlines Spark Testing

Carpenter Steel Co. offers a 20-page spark test guide to help tool steel users quickly and accurately check identity of tool and die steels. Booklet features individual spark diagrams of the 13 standard tool and die steels. This is supplemented with descriptive matter giving detailed spark characteristics for each steel. Guide should aid in identifying tool and die steels that are to be sold for scrap and can help classify steels that have lost their identity in

Have you ever tried to remove rust-preventive oils and greases? It's a messy, time-consuming job . . . it's one your customers don't like . . . and it's really unnecessary! Now . . . thanks to NOX-RUST Vapor-Wrapper your customers can receive machines, parts and equipment "factory-fresh" . . . ready to use. There's no disassembling . . . no de-greasing needed. What's more, *you* save time, work and money by eliminating old-fashioned rust-preventives. When parts are packaged in sheets or bags of Vapor-Wrapper, they're safe from rust and corrosion for years. Find out the facts about this improved, modern method of rust-prevention. Just attach the coupon below to your letterhead for full details without obligation.

NOX-RUST VAPOR-WRAPPER

ROLLS SHEETS ENVELOPES BAGS CASE-LINERS

CAUTION Only Nox-Rust makes the exclusive new Vapor-Wrapper that is impregnated with Cortex, the patented VOLATILE CORROSION INHIBITOR (U. S. Patents 2,521,311 - 2,534,201 - other patents pending)

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DANLY PRESSES

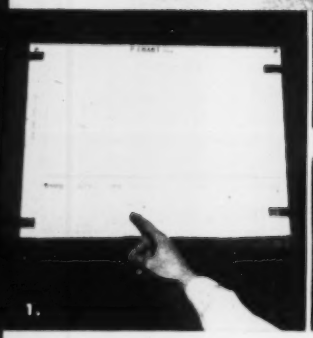
REQUIRE LESS MAINTENANCE...

... at International Harvester's East Moline works — where performance is a matter of careful record!

International Harvester Corn Picker

The 400-ton Danly Straight Side Press shown at right has required an amazingly small amount of maintenance work—an average of less than 2½ hours a week over the last twelve months. And a large portion of this time was consumed by routine press attention such as oiling and adjusting.

Write today for your copy of the Danly Straight Side Press Catalog and see how unique Danly Press construction and design features will achieve similar press operating cost reduction for you.



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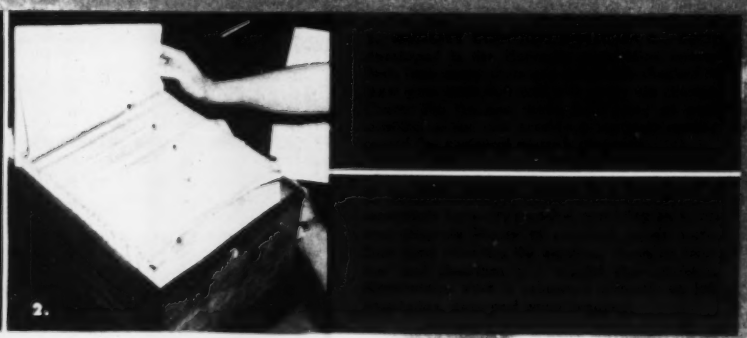

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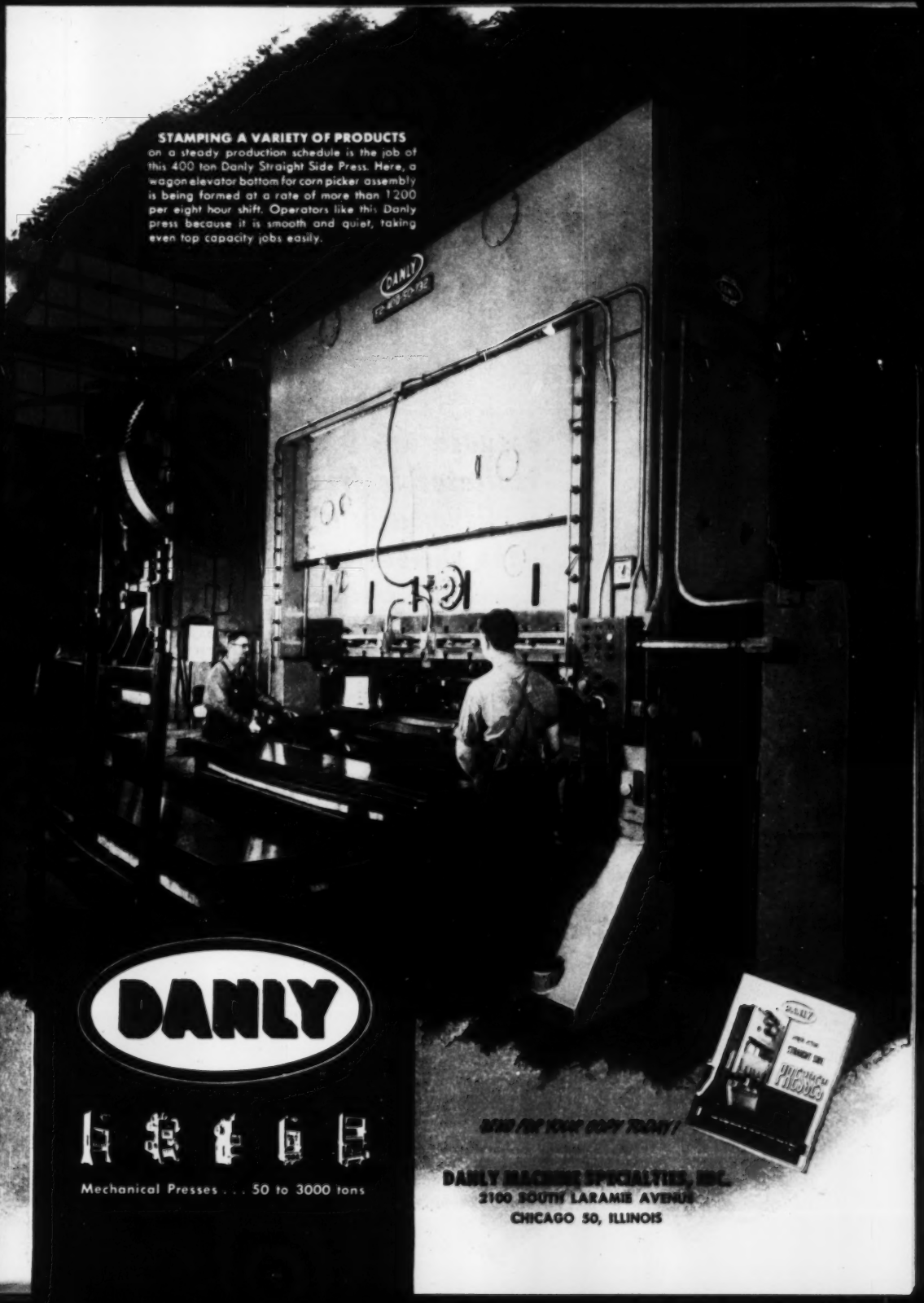

STAMPING A VARIETY OF PRODUCTS on a steady production schedule is the job of this 400 ton Danly Straight Side Press. Here, a wagon elevator bottom for corn picker assembly is being formed at a rate of more than 1200 per eight hour shift. Operators like this Danly press because it is smooth and quiet, taking even top capacity jobs easily.

DANLY

Mechanical Presses . . . 50 to 3000 tons

SEND FOR YOUR COPY TODAY!

DANLY MACHINE SPECIALTIES, INC.
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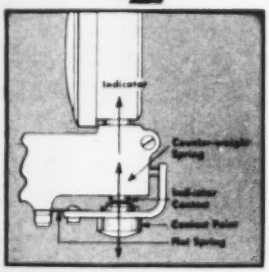
Side Thrusts and Friction Don't Affect this SNAP GAGE

Because the Dial Indicator is free while measuring the dimension



UNAFFECTED BY SHOCKS AND FRICTION

The flat spring supporting the contact point takes all the shocks and side thrusts — the indicator contact point merely rides on the gage contact point. There is no tendency for the indicator spindle to bind. Counter-weight spring offsets weight of gage and of inspector's hand.

FEDERAL MODEL 1000 SERIES GAGES *show you the amount of error* so you can make corrective adjustments *before you begin to produce scrap.* Measurements are not influenced by "feel" and any operator obtains the same reading. These gages are fast, lightweight, and more accurate than conventional "go, no-go" gages.

Five gages enable you to inspect all dimensions from 0" to 6". Price, any one gage with .0005" grads. $57.50 . . . with .0001" grads. $75.00 . . . larger sizes special. There are no extra gage costs when size requirements change — Adjustments can be made easily with a screw driver! Write for folder on these modern gages. Federal Products Corporation, 1214 Eddy Street, Providence 1, Rhode Island.

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Largest manufacturer devoted exclusively to designing and manufacturing all types of DIMENSIONAL INDICATING GAGES.

stock. Further, it can be used to double-check the type of steel before starting to make a tool or die to make sure the right grade is used.

Instructions follow for dressing the grinding wheel and preparing the steel sample. Handbook also provides information on effect of wheel speed on spark stream, explains the difference in spark between hardened and annealed steel and describes effect of various elements on the sparks. Request copies from the company, 339 W. Bern St., Reading, Pa.

Transformer Weight Reduced

Fourth weight reduction in distribution transformers since 1937, effected by redesign of pole-type units, is announced by Distribution Transformer Dept., General Electric Co., Pittsfield, Mass. New design, from 5000-v to lower voltages, reduces over-all weight about 10 per cent and saves critical materials. Weight reduction makes pole-type transformers easier to handle; saving time and expense in installation.

Company says it incorporates improvements in core steel and processing methods into the design. Reduction in use of copper makes it possible to build seven transformers with the same amount of the metal required formerly for six.

In addition to providing stronger construction, the unit offers lower impedances and improved regulation. Clamping structures and coil supports are simplified to increase short-circuit strength. Transformers are available in ratings of 50 kva or less.

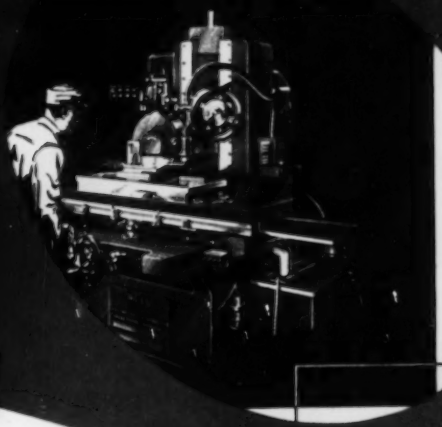
Tool Holder Rights Shift

Walton Co., W. Hartford, Conn., reports it has acquired manufacturing and selling rights to the American tool holder, formerly produced by American Stay Co., E. Boston, Mass. Product is renamed Walton-American, and is offered in three sizes to provide a tool bit capacity from 1/8 to 7/16-inch.

Meehanite Pump Bulletin Ready

Meehanite Metal Corp., New Rochelle, N. Y., offers a 20-page bulletin titled, "Meehanite Pump

ECISION IS PRECISIO



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A sheet of exactly .020" strip steel the size of this page (8¼" x 11¼") weighs approximately 8⅝ ounces.

The same size sheet of .022" (.020", .002" oversize) with the ellipse punched out would weigh the same.

in every ton if the .020" strip steel you order actually measures .002" oversize

footage loss increases as thickness increases, decreases as gauge decreases.

CMP THINSTEEL

the precision gauge tolerance of protects you against such costly losses insures maximum practical yield per ton

the Cold Metal Products co.

See next page for list of THINSTEEL products.

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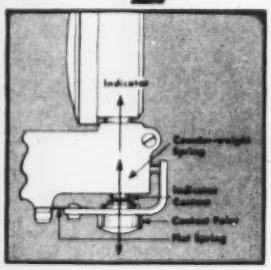

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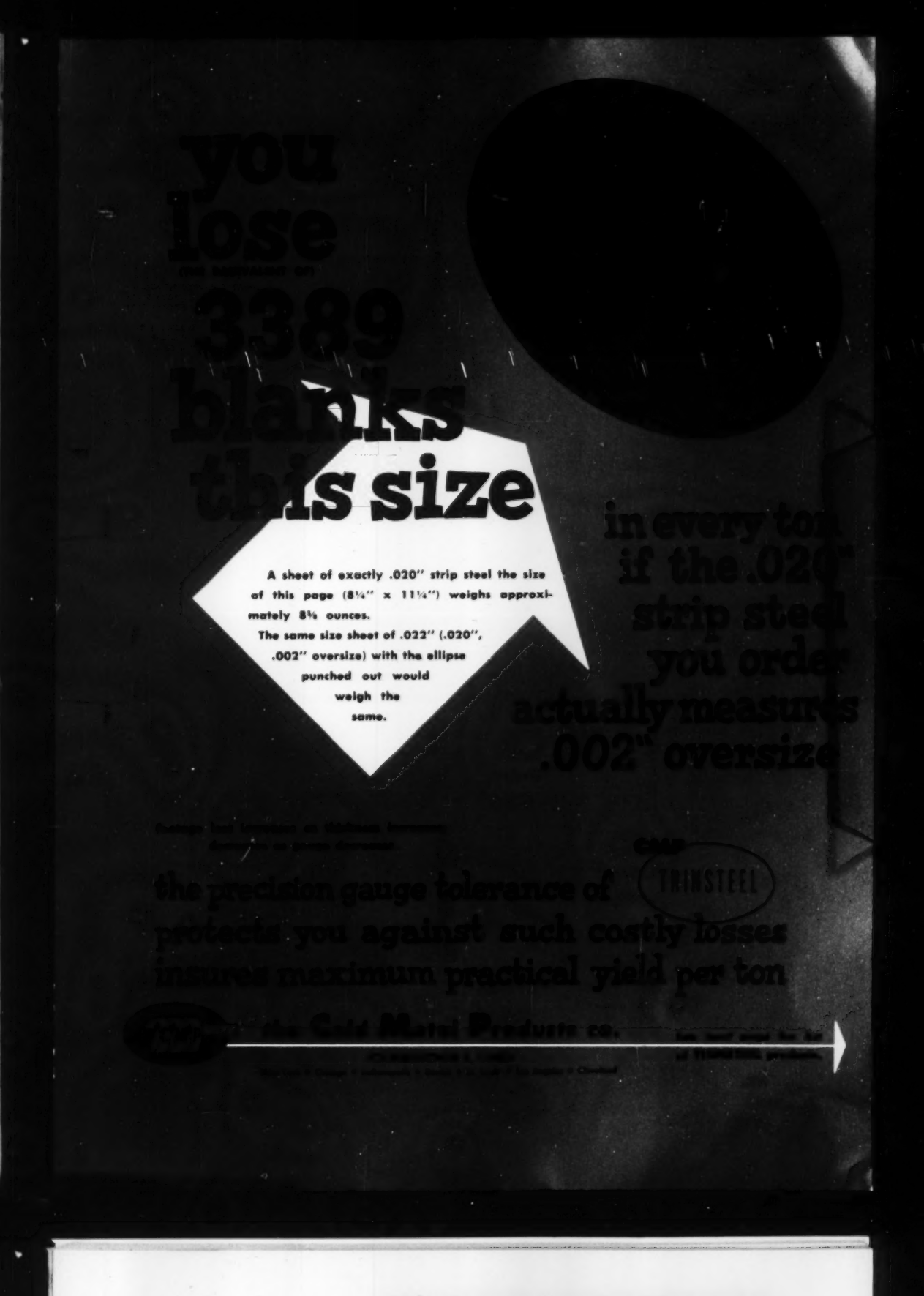
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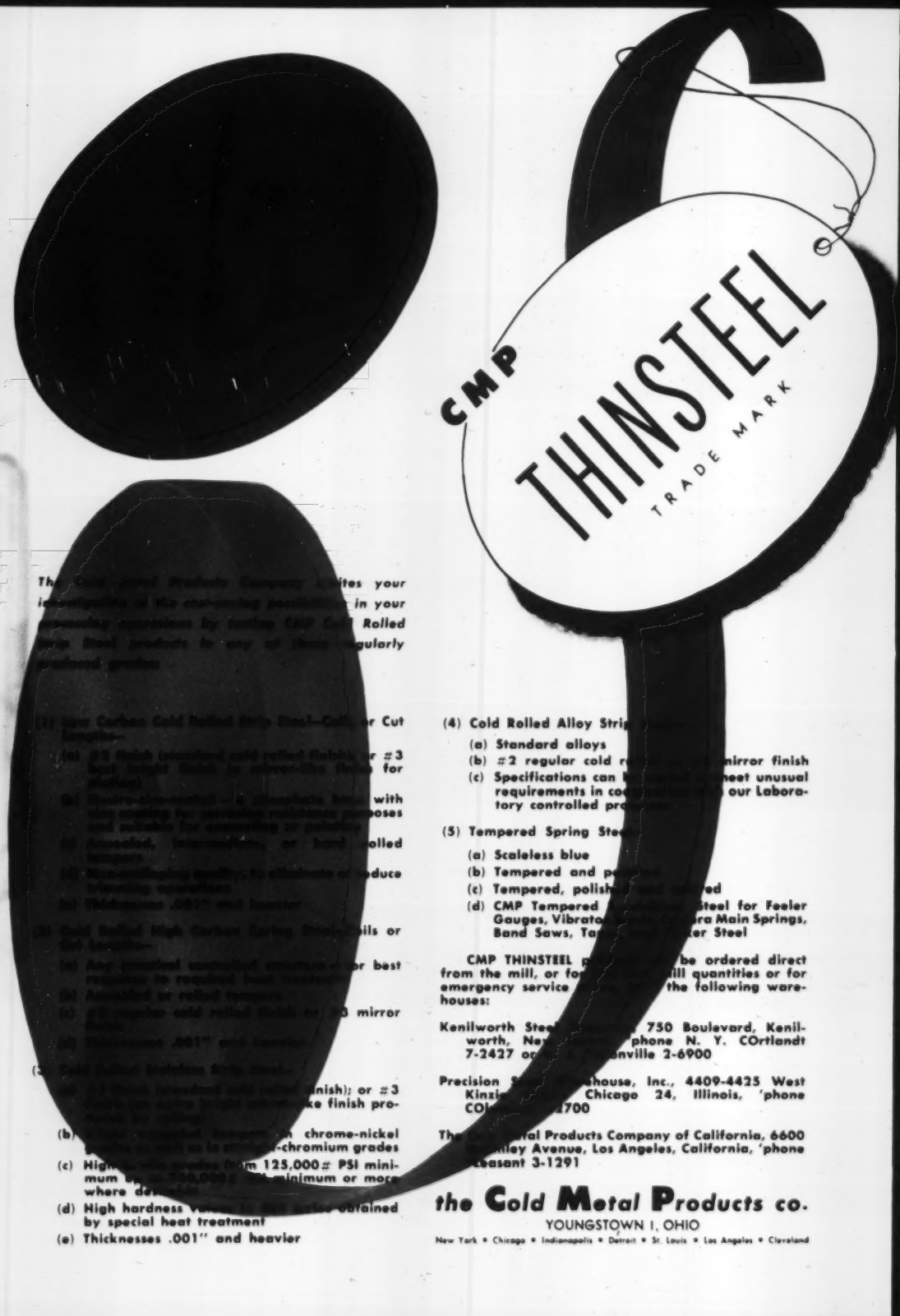
in every ton if the .020" strip steel you order actually measures .002" oversize
the precision gauge tolerance of
protects you against such costly losses
insures maximum practical yield per ton
TRIMSTEEL



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Kinzi[illegible] Chicago 24, Illinois, 'phone
COl[illegible] 700

The [illegible]al Products Company of California, 6600
[illegible]nley Avenue, Los Angeles, California, 'phone
[illegible]easant 3-1291

the Cold Metal Products co.

YOUNGSTOWN 1, OHIO

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Castings." Photographs show pump castings and the various pump types that use Meehanite castings. Also included are tables that illustrate property evaluations made from recent tests covering wear, resistance to acid corrosion, impact and erosion. Copies are available free on request.

Resistors Meet Military Specs

Humidity - resistant vitreous enamel wire-bound resistor is an addition to the line of electronic components made by Sprague Electric Co. Called the Blue Jacket, the development withstands severe performance for characteristic G and J units in joint Army-Navy Specification JAN-R-26A. Initial production is in the complete range of military styles RW-29 and RW39.

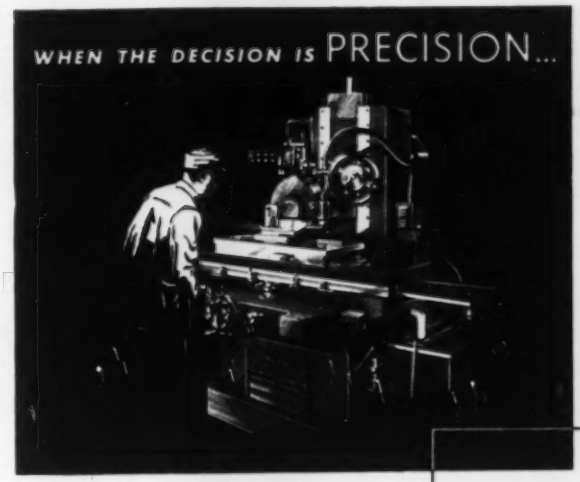
Although vitreous enamel resistors are not new, basic limitations existed that required restriction on power and voltage ratings for a given unit size. These also severely limited degree of thermal shock which the resistor could stand. Choices of materials that were satisfactory from these standpoints gave poor results in high humidity due to electrolysis.

To overcome these problems, developments in fields of winding cores, terminals, resistance wire and enamel coating were required. Thermal expansion characteristics of the ceramic cores, end terminal bands and coating enamel are matched closely to resist violent temperature change. Wire is wound under carefully controlled tension. Winding ends are welded to end bands, as are terminal lugs.

Complete performance data is included in bulletin No. 110, available on request to the company at 197 Marshall St., N. Adams, Mass.

Zinc Die Cast Can Be Welded

Leaflet featuring an article titled "Zinc Die Cast Can Be Welded" is available from Eutectic Welding Alloys Corp. Article shows how Kirksite dies and other zinc die castings can be welded easily without melting the parent metal. Material contains case histories, photographs and technical information on reclamation and repair of the massive dies as well as on delicate



Where extreme tolerances are not required, the choice of any particular grinding machine may not be too important. But, where absolute precision is demanded, the choice is usually *Grand Rapids*.

Defense orders make it impossible to fill orders as quickly as we desire—but we know our customers can appreciate the reasons for delay. As always we'll do our best to serve you.

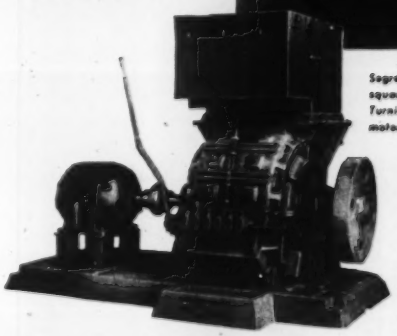
GALLMEYER & LIVINGSTON CO.
307 Straight Ave., Grand Rapids, Mich.

Grand Rapids Grinders
—World's finest

GALLMEYER & LIVINGSTON

TOP SCRAP VALUE
and
TOP CUTTING
OIL RECOVERY

Segregated turnings being fed to special square hopper of an American #2400 Metal Turnings Crusher powered by 50 HP 900 RPM motor. Crown Cork & Seal Co., Baltimore.



Send for Bulletin:
"Metal Turnings Crushers"

The AMERICAN METAL TURNINGS CRUSHER

Long, curly turnings of steel, alloys, brass, aluminum, etc., are rapidly reduced to easily-handled chips requiring only a fraction of usual storage space and increasing cutting oil reclamation to 30 to 50 gallons per ton.

Americans soon pay for themselves!

American PULVERIZER COMPANY
Originators and Manufacturers of Ring Crushers and Pulverizers
1539 MACKLIND AVE.
ST. LOUIS 10, MO.

Balanced Heat Flow IN 'SURFACE

VOLUME PRODUCTION AND CLOSELY CONTROLLED ANNEALING, UNHEARD OF IN PAST EMERGENCIES, ARE POSSIBLE FOR TODAY'S DEFENSE AND CIVILIAN REQUIREMENTS.

Four 'Surface' developments, used together in a balanced heat transfer system, *are breaking records for top speed and true quality in annealing.*

'Surface' harnesses heat for the steel industry. Hundreds of 'Surface' annealing covers and bases in America's leading steel mills employ the components shown below to produce thousands of tons of bright-annealed flat rolled steel each hour. They are operating in every important steel mill center from coast to coast.

Shown here is a battery of 'Surface' radiant tube coil annealing covers of the rectangular double-row type utilizing a protective controlled atmosphere for bright annealing rolled steel sheets.

1 COIL SEPARATOR ● Simple, rugged construction balances convection heating and cooling. Directs rapidly circulated heating and cooling gases to ends of coil laminations. This utilizes solid metal heat transfer, rather than conduction through laminations.

2 HIGH POWERED BASE FAN ● Power input is many times greater than used formerly. Incorporates a unique 'Surface' designed method of sealing annealing atmospheres against differential pressures.

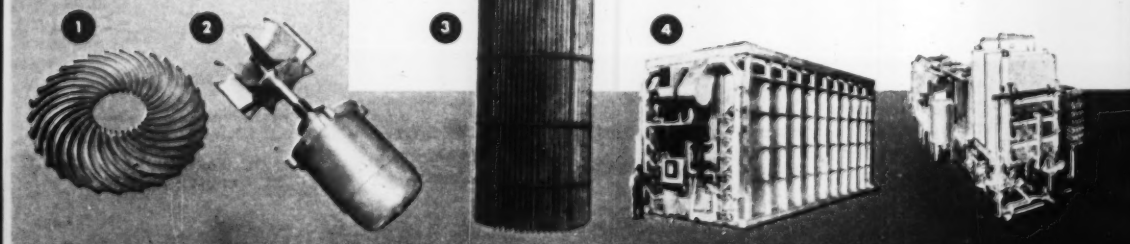
3 CORRUGATED INNER COVER ● Deep corrugations absorb and transfer heat to circulated gases within the inner cover during heating cycle and speed cooling of the charge by reasons of the large area exposed.

4 RADIANT TUBE HEATING COVER ● Stepped-up, useful heat input of 'Surface' radiant tubes balances the fast heat absorption rate of the new deep-corrugated inner covers and fast heat transfer of base fans and coil separators.

Here's an additional 'Surface' development that assures "Quality Control" of heat treated products.

HNX ANNEALING ATMOSPHERE GENERATOR ● Non-explosive HNX gas provides complete surface protection for steel in 'Surface' cover-type annealing furnaces. HNX is an improved form of widely accepted NX gas.

Submit your heating and heat treat problems to 'Surface' engineers for heat-engineered recommendations and latest equipment.



OVERS...RESULTS IN FASTER AND BETTER ANNEAL

SURFACE COMBUSTION CORPORATION • TOLEDO 1, OHIO

FOREIGN AFFILIATE COMPANIES

BRITISH FURNACES LIMITED—CHESTERFIELD
STEIN & ATKINSON, LTD.—LONDON
STEIN & ROUBAIX—PARIS, LIEGE AND GENOA
WILL L. SMITH, S.A.—BUENOS AIRES

'Surface' SERVES THE STEEL INDUSTRY

One-Way Fired Soaking Pits • Billet Reheating Furnaces • Slab Heating Furnaces • Continuous Type, Controlled Atmosphere Strip Annealing and Normalizing Furnaces • Controlled Atmosphere Annealing Covers for Wire and Rod • Controlled Atmosphere Annealing Covers for Coil and Sheets • Continuous Furnaces for Heat Treatment of Steel Plate • Controlled Atmosphere Furnaces for Carbon Correction in High Alloy Rod and Bar Stock • Continuous Type Bright Annealing and Normalizing Furnaces • Prepared Gas Atmosphere Generating Equipment • Pit Type Convection Furnaces for Rod Annealing • Stress Relief Furnaces • Wire Patenting Furnaces

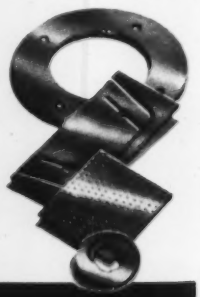
JOHNSON

Bronze on Steel BEARINGS

FOR INDUSTRIAL USES

THEY ARE LIGHT IN WEIGHT and low in cost, have been widely used in automotive and farm equipment, and have certain important industrial uses. They are Bronze-on-Steel (copper-lead) Bearings—precast bearing bronze powder bonded to copper coated strip steel—modern type sleeve bearings developed and patented by Johnson Bronze. They combine the fine bearing qualities of copper-lead alloy with the strength and other physical properties of the steel backing. Johnson engineers will gladly study any proposed application and help you determine whether you can use Johnson Bronze-on-Steel Bearings. Write today.

Ideal for washers, thrust plates and other flat parts requiring a bearing surface.



JOHNSON BRONZE COMPANY
550 South Mill St., New Castle, Pa.

Sleeve Bearing Headquarters Since 1901

JOHNSON Sleeve-Type BEARINGS

white metal scale balance arms.

The company claims success in welding zinc castings through use of its specially formulated low temperature welding alloy, Eutec-Rod 196. This product is also described in the leaflet in data covering applications, characteristics and physical properties. Copies of the publication, TIS 969 can be obtained without charge by writing the manufacturer, Dept. P, 172nd St. & Northern Blvd., Flushing 58, N. Y.

Portable Meters Gage Moisture

More uniform product and improved quality are results of moisture meters used by Coated Products Division, Carborundum Co., Niagara Falls, N. Y. The division faced a problem in taking guesswork out of moisture determination because excessive moisture sometimes led to nonuniform flexing, loss due to mold and paper delamination. At the other extreme, insufficient moisture could cause bond failure.

To achieve on-the-spot measurement, the manufacturer uses TAG Midget moisture meters, made by Weston Electrical Instrument Corp. The meters are portable instruments that indicate directly the per cent of moisture present in

Thirty Stories: One Theme

Rising from the center of downtown Pittsburgh is this new headquarters of Alcoa. The aluminum theme is employed wherever possible. Exterior facing, perforated lath, water pipes, radiant heating coils, storage, tanks, air ducts, interior trim, conduit, busses and wiring are all aluminum

New MEAD INDUSTRIAL AIR POWER CATALOG ready—

Full of suggestions FOR FASTER, CHEAPER PRODUCTION

New MEAD AIR POWER CATALOG illustrates, describes the complete line of famous MEAD-DESIGNED Air Operated Devices which have been speeding work, saving time and money for America's most "Cost Conscious" plants! Get your copy.

IT PICTURES THESE AIR-OPERATED DEVICES

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Send free copy of new, colored MEAD INDUSTRIAL AIR POWER CATALOG describing the complete line of famous Mead air-operated devices.

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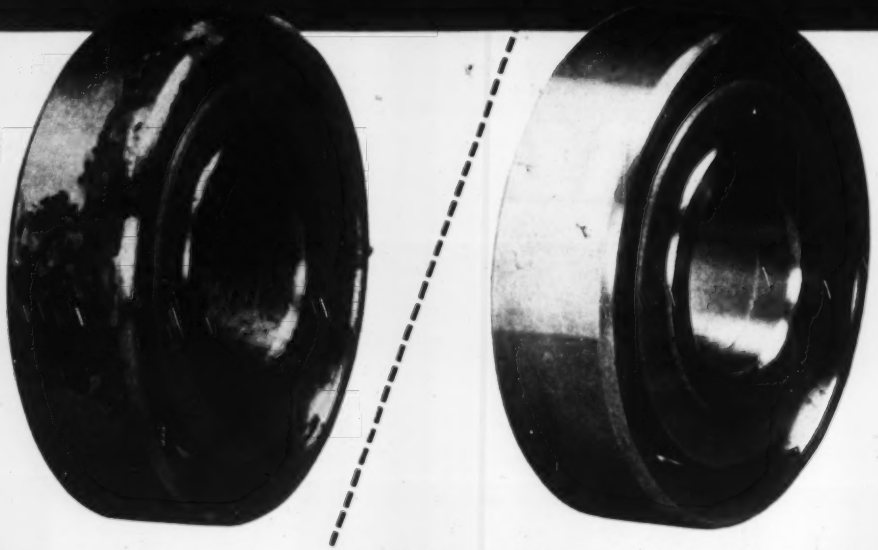
BOTH WERE PROTECTED BY RUST PREVENTIVES...



BALL BEARING TEST is proof! Bearing on left coated with straight petrolatum. Bearing on right protected with "Cosmoline" inhibited rust preventive. Both bearings submitted to 120° F., 100% humidity test for one month. You can see the difference!

HOUGHTON "KNOW-HOW" MADE THE DIFFERENCE!

All of the Houghton rust preventives widely used today had their start in "Cosmoline" way back in 1869. It was a good product even then. Since then, many types of "Cosmoline" have been developed to meet and exceed government specifications, through two World Wars. Industry generally knows these Houghton rust preventives as "Rust Vetoes"—the trade name used where government "specs" do not apply.

The big difference between ordinary rust preventive oils or greases and Houghton "Cosmolines" or "Rust Vetoes" is *permanency of protection.* Although Houghton rust preventives are readily removed when required, they give your parts or products the safe, long-term protection you want, indoors or out—on shelves or in shipment—idle or in use.

Our latest Rust Preventives Bulletin includes a chart describing the products—some of which are listed on this page—gives their varying types of protection and their wide range of uses throughout industry. Ask the Houghton Man for a copy or write to E. F. Houghton & Co., Philadelphia 33, Pa.

HOUGHTON "COSMOLINE"
to meet Government Specifications

Cosmoline 2-82C (Type P-4)
Cosmoline 2-121 (Type P-5)
Cosmoline 2-84B (Type P-6)
Cosmoline 333 (Type P-12 AN-C-124A)
Cosmoline 377 (Type P-3 AXS-1759 Gr. 2)
Cosmoline 332 (Type P-7 USA-2-122)
Cosmoline 335 (MIL-L-3150)
Cosmoline 946 and 947 (Type P-10 USA 2-126)
Cosmoline 911 (MIL-C-6708-Type 1)
Cosmoline 344 (Type P-1 AXS-673)
Cosmoline 1120-1123 (AN-VV-C-576B)
Cosmoline 910 (JAN-P-115 Wax)

HOUGHTON "RUST VETO"
to meet general industry needs

Rust Veto 344—Solvent, Polar Type
Rust Veto 110-D—Varnish Type
Rust Veto A-2—Dry Film, Waxy Type
Rust Veto 377—Solvent, Oil Type
Rust Veto 266—Fingerprint Neutralizer
Rust Veto Light, Medium, Medium Heavy, Heavy, and Extra Heavy—Inhibited Oil Types
Rust Veto Concentrate—for dilution by user

COSMOLINE and RUST VETO
. . . products of

E. F. HOUGHTON & CO.
PHILADELPHIA · CHICAGO · DETROIT · SAN FRANCISCO

Ready to give you on-the-job service . . .

coated products at all stages of production.

All backings used for coating with various types of abrasive grain—paper, cloth, fiber and fiber combinations — are subject to changes in atmospheric conditions. An additional problem arises when such fluid adhesives as resins and glue are used as bonding agents. To combat this, meters are used in initial coating operations to observe drying conditions, then to insure proper moisture content in the coated material when it is removed from drying rooms. Another application is found in auxiliary drying and curing stages, where dehydration of backings and coatings must be prevented. Before finishing, another test shows whether product is in proper condition to achieve best quality.

Greater Load for Gas Turbines

An increasing amount of future industrial work load will be borne by powerful and versatile gas turbines—descendants of the power plant that drives jet planes at supersonic speeds. That prediction was made by F. T. Hague, aviation and research consultant for Westinghouse Electric Corp., when he addressed the national spring meeting, American Society of Mechanical Engineers, at Seattle.

A relative newcomer to the engine field, the turbine already acquits itself favorably in such jobs as spinning generators to produce electric power, driving locomotives and ships, or pumping liquids and gasses through big pipelines. Now that an idea of its scope has been gained, says Mr. Hague, the gas turbine should assume constantly-increasing importance.

The engineer traces the power plant's history in his paper, "The Pattern of Gas Turbine Development in Europe and the U. S." In size, units now range from a 45-hp machine operating a Navy fire pump to one driving a 15,000-kw electric power generator. For maximum efficiency, turbines can be designed to use any of a wide variety of fuels from residual fuel oil to coal.

Because of extreme versatility, in many types of application the basic gas turbine cycle makes it possible to tailor-make the engine

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If abrasive cutting is already a production function in your plant . . . or if you're just considering its possibilities . . . you will want a copy of the NEW Allison Catalog. Information on both wet and dry cutting of various materials . . . information on abrasive cutting machines and their maintenance . . . recommendations for the selection of Allison Abrasive Wheels . . . written by *specialists in abrasive cutting for over 30 years!* Send coupon today . . . your copy will be mailed promptly.

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One-plunge Grind for the External Airfoil Surface of Turbojet Buckets or Blades . . . . . on the

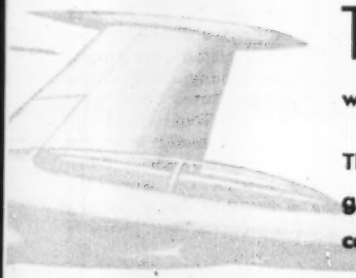
Making better products to make other products better

NORTON COMPANY, WORCESTER 6, MASS., U. S. A.

DISTRICT SALES OFFICES: HARTFORD • NEW YORK • CLEVELAND • CHICAGO • DETROIT

NORTON Compound Contour Jet Blade Grinder

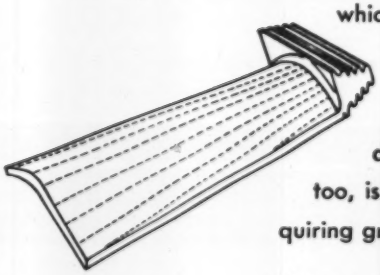
[Patent Applied for]



The complicated engineering problem of grinding jet engine buckets and blades having twisted contour but with straight line fairing has been solved.

The NORTON Compound Contour Jet Blade Grinder plunge grinds blades semiautomatically with a positive control of contour and finish of the external airfoil surface.

An ingenious arrangement of cams in dual shape-producing units provides the precisely correct motion for the workpiece which presents the surfaces to be ground at the horizontal centerline of a wide grinding wheel.



This set-up permits efficient grinding, high production and consistently high quality. Important, too, is the fact that all this is accomplished without requiring great effort or skill on the part of the operator.

This unique, new NORTON design includes many important engineering features and principles proved in the NORTON Type CTU line of cylindrical grinding machines.

If you, too, have the problem of obtaining high production and consistent accuracy combined with ease of operation in grinding complicated shapes, our engineers will be glad to provide specific recommendations—at no obligation to you.

To Economize Modernize with NEW

NORTON

GRINDERS and LAPPERS

for the type of job to be done, reports Mr. Hague. He adds, "Future improvements are more promising for the gas turbine than for any other form of heat engine."

Rivets Used in Welding

Miles Mfg. Co., Cleveland, joins two dissimilar materials by resistance welding in combination with a rivet. To make a plasterer's or a cement finisher's trowel, they join a blade of Swedish spring steel with the aluminum mountings on a bench welder made by Taylor-Winfield Corp., Warren, O.

Low carbon steel rivet is placed in each hole and the entire assembly placed in the welder jig. Flathead rivet contacts the edge of the drilled hole to act as an annular projection for the weld. Burrs and rivet head are ground off.

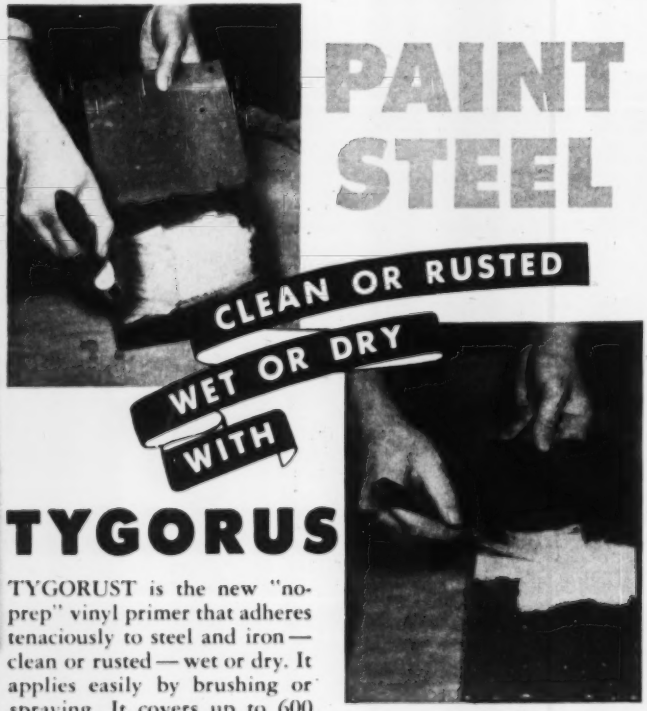
Drills Locked to Jig

Adapter for locking Keller air drills in place when drilling holes ¼-inch to ⅜-inch in hardened steel speeds drilling operations at Texas Engineering & Mfg. Co. Inc., Dallas. Operations are also safer and more accurate.

Two sets of hardened steel lugs are employed. One set is welded to opposite sides of the adapter and the other to opposite sides of a liner bushing attached to the jig. Opposing surfaces are ground at an 11 degree angle. When the drill is inserted through the bushing in the jig, a counterclockwise turn of the drill motor locks the two sets of lugs together. When the drill touches the work, the torque of the drill motor housing forces the lugs tighter giving a firm union.

Heat Treater Expands Facilities

Expanded facilities that include vapor blasting and liquid honing, sand blasting and barrel finishing for tumbling, deburring and microfinish polishing are announced by Ace Heat Treating Co., Elizabeth, N. J. Using methods attained with its new equipment, the company can produce finishes as fine as 2 microinches. This precise surface polishing is possible, as is deburring, on many parts that have been subject to slower hand operations. Double-handling is also eliminated



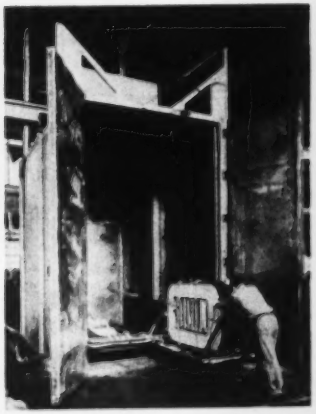
TYGORUST is the new "no-prep" vinyl primer that adheres tenaciously to steel and iron — clean or rusted — wet or dry. It applies easily by brushing or spraying. It covers up to 600 square feet per gallon. It dries hard in minutes. It can be top-coated in an hour, or less. It provides excellent adhesion for all types of finishes. It inhibits rust formation. It has good chemical resistance.

TYGORUST can also be used to prime concrete, wood, and previously painted surfaces (asphaltic coatings excepted). It is particularly recommended as a primer for chemically resistant, vinyl-based coatings.

For minimum surface preparation, use TYGORUST! For maximum chemical resistance, use TYGORUST top-coated with TYGON "Series TP" Paint!

WRITE TODAY FOR FULL DETAILS!

THE U. S. STONEWARE CO.
Plastics and Synthetics Division
AKRON 9, OHIO



Sure Cure for New Varnish

Automatic controls regulate gas or electric heat to maintain constant temperature in this 8 x 13 x 15-foot varnish insulation curing oven. Air changer keeps heat in constant motion for evaporation and removal of varnish solvents. Oven is installed in Westinghouse Electric Corp.'s Buffalo plant

HOW 3 COMPANIES STEPPED-UP PRODUCTION, CUT COSTS — WITH

Delta Multiple-Spindle

DRILL PRESS SET-UPS...

AT WEBSTER ELECTRIC COMPANY
RACINE, WIS.

This four-spindle set-up of Delta 14-inch drill presses is used to drill and tap phonograph needle chucks at the rate of 125 units per hour, representing an important saving in time and production cost. Set-up time has been reduced to a minimum by bolting fixtures for the entire sequence of operations to a special removable plate laid on the drill press table.

AT SKILLMAN HARDWARE MFG. CO.
TRENTON, N. J.

Final operations on the escutcheon or face-plate of a door lock are performed by four Delta 14" drill presses, as follows: (1) drill a 1⅛" cylinder lock hole; (2) drill ⅝" door-knob hole; (3) ream the ⅝" hole; and (4) four small attaching-screw holes drilled and countersunk. Every set-up of two or more Delta drill presses boosts production, says management.

AT KARL LIEBERKNECHT, INC.
READING, PA.

Four Delta 17" drill presses drill, tap, body drill and countersink 60 $\frac{5}{32}$" holes in a bar member of a 32-ton knitting machine. Capacity is 17 bars per 8 hours. No special set-up man is needed—operators find it easier and much quicker to do it themselves, make set-ups or change-overs in a few minutes. Delta equipment is said to pay for itself in about two years.

These and scores of other time-saving, cost-cutting set-ups of Delta multiple-spindle drill presses were devised by the users—ample proof that you can do the same. Delta sectional tables allow easy set-ups of any number of drill heads —from 2 to 200

Why not survey your own machining operations? Your Delta dealer can help, with a wealth of data as to how others have solved problems similar to yours. He's listed in the Classified Directory under "Tools."

There's a Delta Power Tool for Your Job-

WOOD OR METAL WORKING

53 Machines • 246 Models • More Than 1300 Accessories

Another Rockwell Product

DELTA POWER TOOL DIVISION

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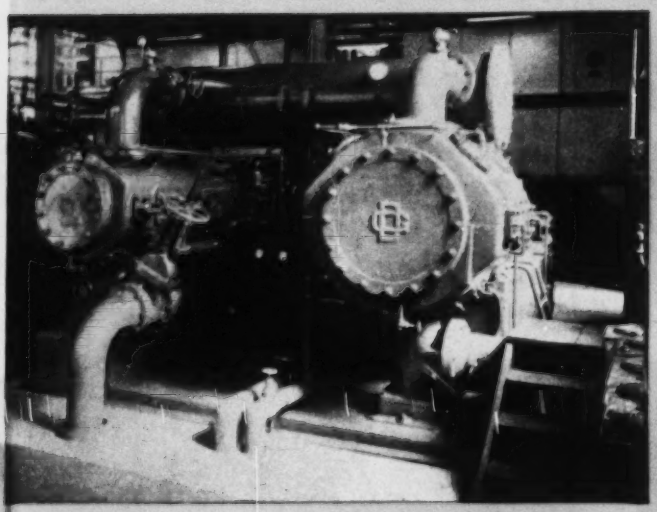
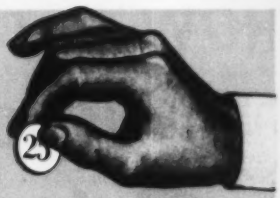




$1.25

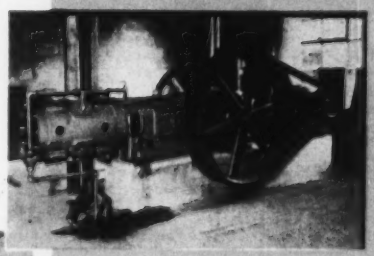
Pin Money Maintenance!

That's all it takes to keep a Gardner-Denver HA Compressor puffing away at top efficiency. One HA, for example, has been handling the full air load in a southern foundry and manufacturing plant for eight years—and has required only $10.00 for maintenance. That's $1.25 a year!

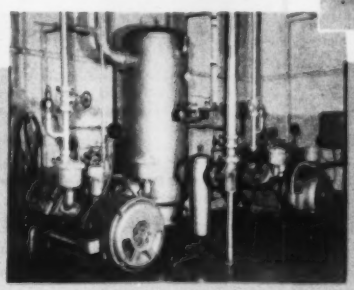
How come? A look at the soundly built power end and the reliable lubricating system will give you some of the answers.

And how about operating costs? They're unusually low, too—thanks to Gardner-Denver correctly designed air cylinders and low-lift "Air Cushioned" valves.

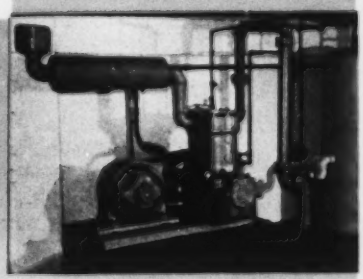
Another dependable compressor —the Gardner-Denver RX.



Space-saving efficiency—the Gardner-Denver WB Compressors.



For low-cost compressed air in any volume—choose Gardner-Denver Compressors. Write today for full details.



For continuous service—Gardner-Denver AA Compressors.

SINCE 1859

GARDNER-DENVER

Gardner-Denver Company, Quincy, Illinois
In Canada:
Gardner-Denver Company (Canada), Ltd., Toronto, Ontario

THE QUALITY LEADER IN COMPRESSORS, PUMPS AND ROCK DRILLS

by including both heat treating and finishing under one roof to effect a sufficient saving in handling costs to offset additional finishing expense.

Rotary Unit Works Small Tubes

Difficulties in straightening small tube sizes, such as alloy steel tubing 0.250-inch OD, are overcome with a rotary straightener installed by Summerill Tubing Co. The firm, a division of Columbia Steel & Shafting Co., Carnegie, Pa., uses the straightener for handling stock 0.156-0.437-inch OD at 120 fpm.

Machine is the model AY made by Mackintosh-Hemphill Co., Pittsburgh. It requires one man to work

ROTARY TUBE STRAIGHTENER
...handles stock 0.156–0.437-inch OD

on 10-25-foot lengths instead of the two operators necessary in previous work. Full roll contact permits straightness and finish end to end superior to that required by commercial tolerances. Guides are unnecessary, so tubing is not marked and no production is lost to guide-dressing.

Seamless Practices Analyzed

Detailed survey of the best U. S. practices in producing steel for manufacture of seamless tubing is available from the U. S. Dept. of Commerce. Prepared by Metals and Minerals section, Office of Technical Services, with assistance of steel industry metallurgists, survey was made for the Mutual Security Agency.

Copy of "Electric Steel Ingot Practice for Seamless Tube Manu-

HEWITT-ROBINS

For Tough Materials Handling Jobs

HEWITT-ROBINS VIBRA-VEYOR

Handles Anything A Belt Conveyor Can't

Faster: The Hewitt-Robins Vibra-Veyor moves a full pan load of material . . . hot or cold, wet or dry, lump or pulverized . . . quickly, quietly . . . on the horizontal—downhill—uphill to 10°.

More Efficient: Won't bog down even when loaded to the top of the pan . . . the Vibra-Veyor takes multiple feeds—starts under full load—has feeder action—spreads surges.

Easier To Install—Maintain: The Vibra-Veyor requires no heavy foundation because vibration in the base structure is kept to a minimum—needs lubrication at only 4 points.

Discover For Yourself how a Hewitt-Robins Vibra-Veyor can fit into your operation. Write for Bulletin 135.

HEWITT-ROBINS HR **INCORPORATED**

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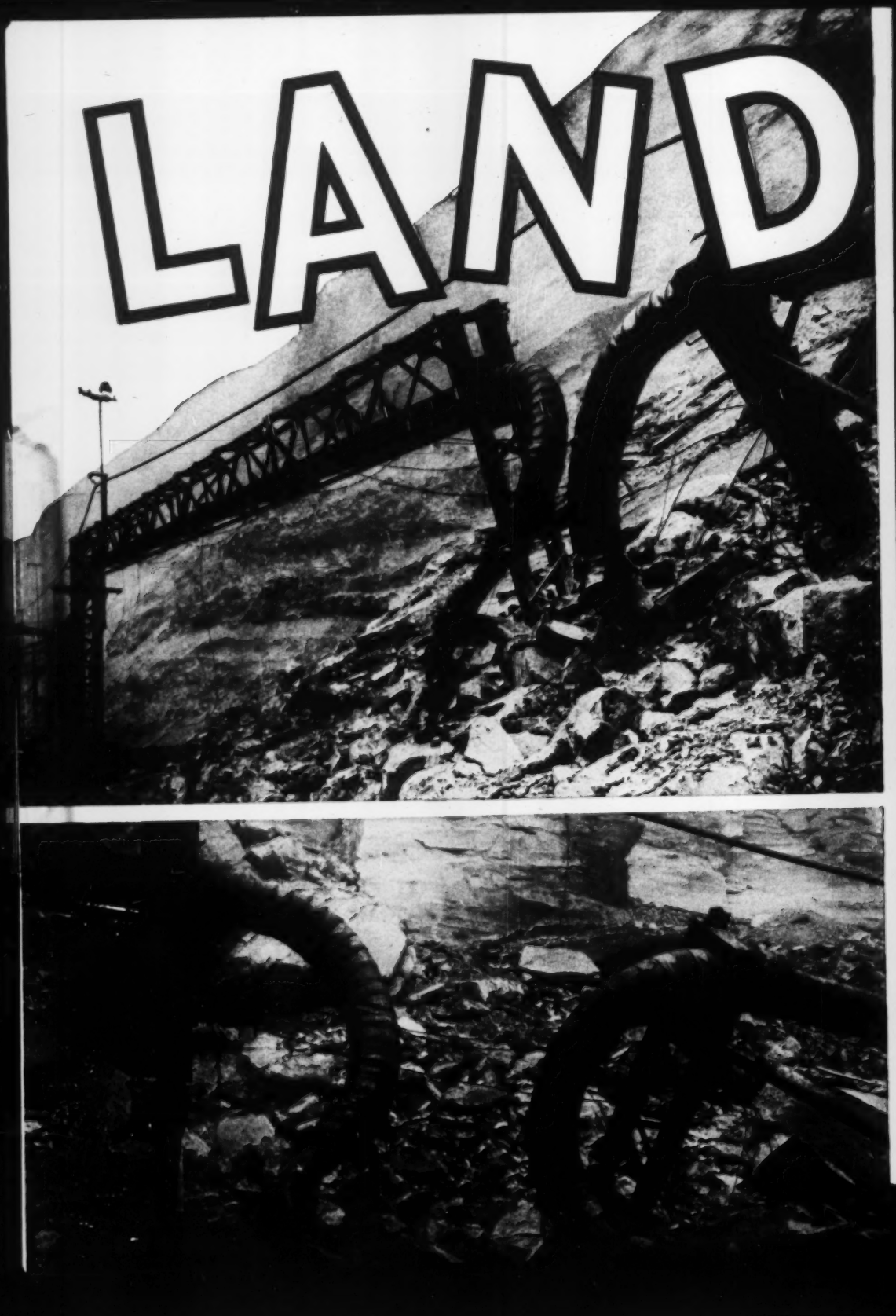
LAND

SLIDE!

but this line did not fail

That landslide dumped hundreds of tons of rock on this steam line of National Seamless Steel Pipe, but service continued *uninterrupted* without a sign of break, or leak, or distress of any kind in the pipe.

That's the beauty of National Seamless. It can "roll with the punches" and come back for more.

Of course you don't buy pipe to wrestle with landslides. But you do buy pipe with the expectation that it will stand up under a lot of punishment in service—if the unexpected should happen. In other words, you want a good margin of safety beyond the line of ordinary duty. Well, that's exactly what made Seamless the wise choice in this particular landslide and in many other similar instances where unexpected stress and strain gave the pipe a real workout to prove its superior strength.

From points all around the country and from various types of service, come reports like this to confirm the wisdom of those who in the past have specified Seamless—Walls Without Welds—America's most widely-used pipe, where reliability is the first consideration.

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COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO, PACIFIC COAST DISTRIBUTORS
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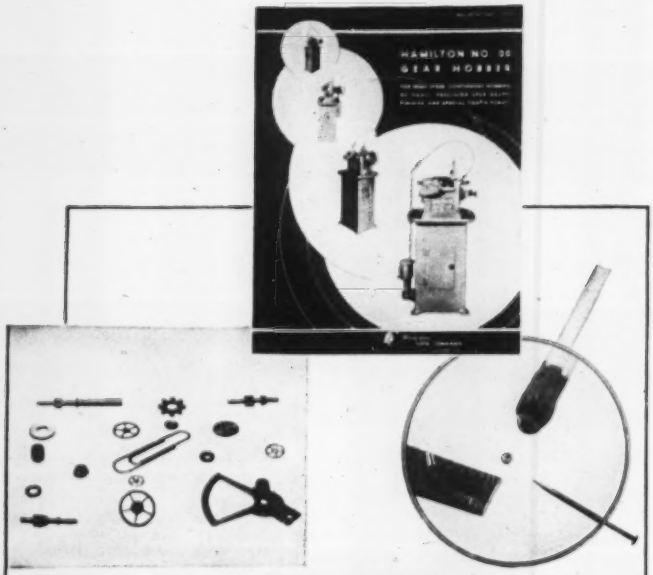
PIPE AND TUBING

UNITED STATES STEEL



THE MOST NEWS
and
THE BEST NEWS

ABOUT SMALL, PRECISION SPUR GEAR HOBBING

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FOR A MINUTE AND A PENNY

Does your job involve small, precision spur gears? Would you like to produce them fast?

Whether your work calls for long production runs or frequent set-ups, you need to know about the Hamilton No. 00 Precision Spur Gear Hobber. Spend a minute now to send your request for a copy of our Bulletin No. H-00-49. Acquaint yourself with this efficient tool, and be ready for the challenge ahead.

NOTE: If you are interested in helical gears, worm gears, bevel gears, and crown gears, as well as spur gears, ask for Bulletin H 1-49. No obligation.

THE Hamilton TOOL COMPANY
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facture," PB 106 027, will be sent for 50 cents, on request to Office of Technical Services, Washington 25.

Selects Stressed Material

More than 20 creep machines guide selection of materials for stressed parts of steam and gas turbines and jet engines in one of the most modern U. S. laboratories devoted to studying high temperature creep. Work is done at S. Philadelphia Works, Westinghouse Electric Corp. Baldwin-Lima-Hamilton testing machines in use were developed originally by Westinghouse in E. Pittsburgh.

Two types of tests are employed to evaluate materials' creep characteristics. One is a short-time test at relatively high temperatures, loads and deformations (1 per cent in 100 hours) on jet engine materials that have life requirements as low as 300 hours. The other is for steam turbine materials that must have a life of 20 years or more at lower temperatures and loads. Specimens for all tests are 0.505-inch diameter test bars.

For tests of jet engine materials, usually precision cast, five automatically-recording, screw-type creep machines are used. The loads applied produce creep failures in periods from 30 to 100 hours when specimens are subjected to temperatures 1200-1600° F. Temperatures are recorded and controlled automatically within close limits by three thermocouples on each specimen and by three separate electric heating elements in the furnace surrounding each specimen.

Twelve level-type creep machines are used for most tests of steam and gas turbine materials that are subjected to evaluated temperatures. Test periods range from 1000 to 22,000 hours at 800-1200° F. These temperatures are also controlled automatically by three thermocouples and three-element furnaces.

In addition to conventional creep tests, bolt materials are subjected to relaxation tests at high temperatures. Relaxation machine, also designed by Westinghouse and made by Baldwin, shows the rate bolt materials may lose initially-imposed loads when held under constant strain at elevated temperatures.

fine Jessop steel is most carefully watched

There is more than skillful melting and working and treating behind Jessop's reputation for the finest specialty steels. Each batch is subjected to rigid quality control at all stages, to assure precise formula and condition. When you buy from Jessop, you buy more than good steel. You acquire metal that is custom-made to your specific need.

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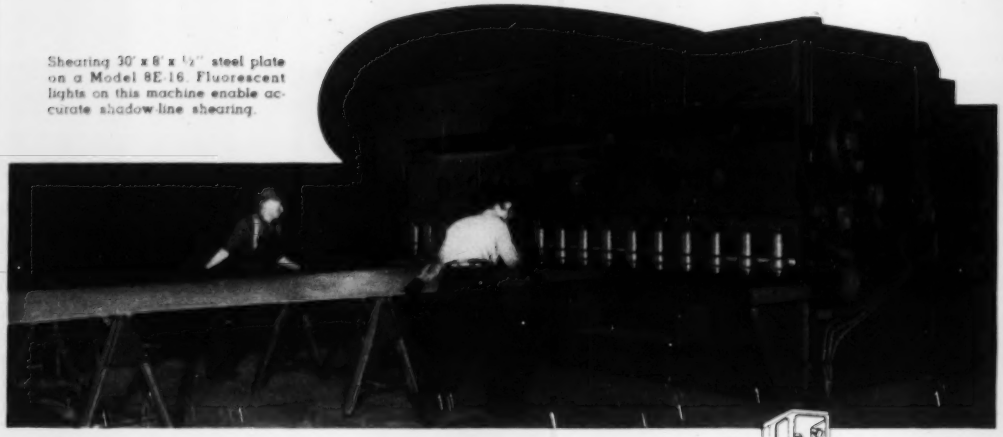
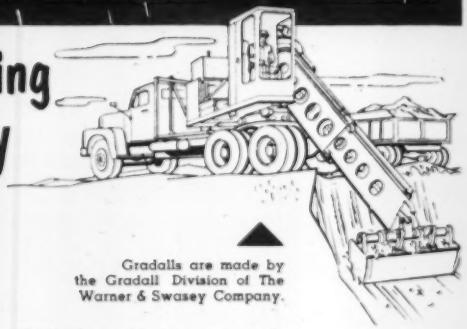


Shearing 30" x 8' x ½" steel plate on a Model 8E-16. Fluorescent lights on this machine enable accurate shadow-line shearing.

Smooth, Accurate Shearing Aids Warner & Swasey Gradall Production



Gradalls are made by the Gradall Division of The Warner & Swasey Company.

A Steelweld Pivoted-Blade Shear cuts all the plate used in the manufacture of Warner & Swasey's Gradall Multi-Purpose Earth-Moving Machines.

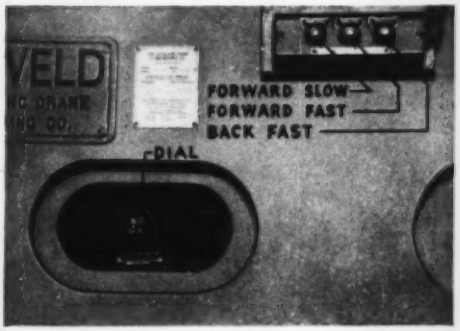
Because of the simple Micro-Set knife clearance adjustment it produces clean, sharp cuts to close tolerances in various thickness metals ranging from light gauge to ½".

The motor-driven back gauge is very popular with the operators because of the ease and speed with which it can be set. Simply by pushing buttons at the middle front of the machine and reading a dial which records to 1/64 inch, the gauge is quickly positioned exactly as required.

Steelweld Shears and Gradalls are alike in many respects: Heavy all-welded construction — Many new and revolutionary features — Entirely different in operating principle from other similar-purpose machines. Both speed the work and cut costs.

If you work with metal plate of any kind, you should have the facts on Steelweld Shears. A Steelweld representative will be glad to call on you at your convenience.

Dial and control buttons conveniently located at middle front of shear for setting motor-driven back gauge.



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New Streamlined Production Technique That Saves Both Days and Dollars

50B50 steel bars are progressively heated to 350° at the rate of 900 feet per hour, by a TOCCO Induction Heating patented process.

De-scaling Bars with TOCCO* Induction Heating

THE PROBLEM—Axle shaft blanks for famous International Harvester farm tractors are normalized, hardened and drawn in conventional open-fired gas furnaces. Considerable scale is formed by these heating operations which, of course, must be removed. Formerly these heavy bars (85 lbs. each) had to be trucked to tumble mills for cleaning. This took time and money—over $7000 annually in labor costs alone, not counting heavy maintenance expense on the tumble mills.

THE SOLUTION—International Harvester engineers found that by using TOCCO* Induction Heating to raise bar surface temperature suddenly to 350°F the thermal shock removed the scale cleanly and completely. Bars are now *automatically* fed to descaling unit, *automatically* descaled by TOCCO, and *automatically* ejected onto pallets. The draw furnace operator merely "keeps his eye on" the descaling operation—no separate operator is needed—and best of all, expensive and time-wasting trucking to and from the tumble mills has been eliminated.

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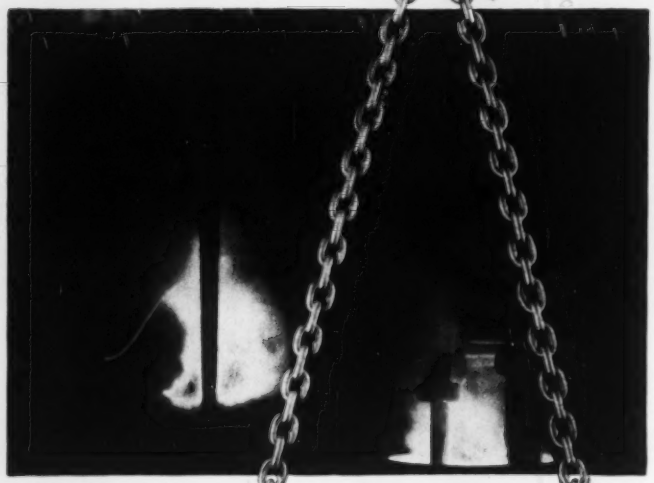
SLING CHAINS

STRENGTH—Size for size, no other sling chain offers a greater tensile strength. HERC-ALLOY will not crystallize—never requires annealing.

SAFETY—HERC-ALLOY Sling Chains are made to your specifications. Every new sling carries a written guarantee, is registered and tested before shipping. This registration serial number is carried at the top link.

● Serial number permanently affixed near top link for positive identification.



● Identify HERC-ALLOY by the patented Inswell side weld with the extra swell of metal on the inside of the link.

EFFICIENCY—Lighter, stronger HERC-ALLOY Sling Chains feature the exclusive short, narrow link design which holds firmer, less tendency to kink, less gouging. Workmen handle HERC-ALLOY with less effort.

PREFERENCE—Men who buy and use sling chains are influenced only by facts learned through experience. HERC-ALLOY Sling Chain preference has been built up over the years, not just by what we say, but by how HERC-ALLOY performs on the job.

Write for Data Book No. 3 which contains much useful manufacturing and application information on HERC-ALLOY Sling Chains.

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CALENDAR
OF MEETINGS

April 16-18, American Institute of Electrical Engineers & American Welding Society, Detroit Section: Annual welding conference, Rackham Memorial Bldg., Detroit. Conference publicity: J. S. Francis, Consumers Power Co., Jackson, Mich.

April 17-18, Caster & Floor Truck Manufacturers Association: Spring meeting, Hotel Hollenden, Cleveland. Association address: 7 W. Madison St., Chicago 2. Secretary: Harry P. Dolan.

April 17-18, American Machine Tool Distributors Association: Annual spring meeting, Edgewater Beach Hotel, Chicago. Association address: 1900 Arch St., Philadelphia. Executive secretary: Thomas A. Fernley Jr.

April 18-19, Lead Industries Association: Annual meeting, Hotel Drake, Chicago. Association address: 420 Lexington Ave., New York 17. Secretary: Robert L. Ziegfeld.

April 18-19, National Association of Cost Accountants: Regional cost conference, Atlanta. Association address: 505 Park Ave., New York 22. Secretary: A. B. Gunnarson.

April 18-21, Grinding Wheel Institute: Spring meeting, The Homestead, Hot Springs, Va. Institute address: 2130 Keith Bldg., Cleveland 15. Secretary: Frank G. Gustafson.

April 20-24, National Industrial Service Association: Annual convention, Hotel Conrad Hilton, Chicago. Association address: 818 Olive St., St. Louis 1. Convention publicity: McGiveran-Child Co., 162 N. Clinton St., Chicago 6.

April 21-22, American Coke & Coal Chemicals Institute: Eastern regional meeting, Westchester Country Club, Rye, N. Y. Institute address: 711 14th St., NW, Washington. Executive secretary: Samuel Weiss.

April 21-22, American Zinc Institute Inc.: Annual meeting, Hotel Statler, St. Louis. Institute address: 60 E. 42nd St., New York 17. Secretary: Ernest V. Gent.

April 21-24, Society of Automotive Engineers: National aeronautic and aircraft engineering display, Hotel Statler, New York. Society address: 29 W. 39th St., New York 18. Secretary: John A. C. Warner.

April 23-25, American Institute of Steel Construction Inc.: Spring engineering conference, Hotel Commodore, New York. Institute address: 101 Park Ave., New York 17. Executive vice president: L. Abbett Post.

April 27-May 1, American Ceramic Society: Annual meeting, William Penn Hotel, Pittsburgh. Society address: 2525 N. High St., Columbus, O. Secretary: Charles S. Pearce.

April 28-29, Association of Iron & Steel Engineers: Spring conference, Netherland Plaza Hotel, Cincinnati. Association address: 1010 Empire Bldg., Pittsburgh 22. Managing director: T. V. Ess.

April 28-30, Chamber of Commerce of the U. S.: Annual meeting, Chamber of Commerce Bldg., 1615 H St. NW, Washington 6. Executive vice president: Arch N. Booth.

April 28-May 3, Concrete Reinforcing Steel Institute: Annual meeting, The Greenbrier, White Sulphur Springs, W. Va. Institute address: 38 S. Dearborn St., Chicago 3. Managing director: H. C. Delzell.

April 29-30, Metal Powder Association: Annual meeting and metal powder show, Hotel Drake, Chicago. Association address: 420 Lexington Ave., New York 17. Acting secretary: Robert L. Ziegfeld.

April 30-May 4, Industrial Diamond Association of America Inc.: Annual meeting, Princess Hotel, Bermuda. Association address: 124 E. 40th St., New York. Secretary: Athos D. Leveridge.

May 1-7, American Foundrymen's Society: Annual meeting, Convention Hall, Atlantic City, N. J. Society address: 616 S. Michigan Ave., Chicago. Secretary: W. W. Maloney.

May 1-7, Annual International Foundry Congress & Exposition: Convention Hall, Atlantic City, N. J. Host: American Foundrymen's Society.

May 2-3, Industrial Fasteners Institute: Annual meeting, The Homestead, Hot Springs.

(Continued on p. 145)

MAXIMUM SHOCK RESISTANCE

LARGE QUANTITY PRODUCTION PER TOOL

BETTER RESISTANCE TO WEAR AT HIGH TEMPERATURE

MOST ECONOMICAL UNIT COSTS

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HOLD CLOSE TOLERANCES LONGER

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Firth Sterling "MOLY" HIGH SPEED STEEL

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There is a Firth Sterling high speed steel for every purpose . . . whether high speed cutting, holding close tolerances, machining abrasive material, general shop work, or specialized application.

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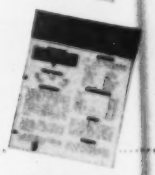
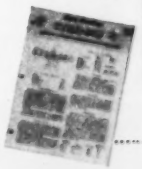
NEW VAN M3 CHIP	Its higher vanadium and carbon content combine to produce superior WEAR-RESISTANCE . . . ideal for cutting hard materials . . . and for holding close tolerances.	For complete information on Van-Chip, ask for Bulletin SL-2033. 
STAR-MO ★	A moly-tungsten steel recommended for GENERAL MACHINING operations.	For complete information on Star-Mo, ask for Bulletin SL-2015. 
HI-MO	A made-to-order steel for SPECIAL PURPOSE applications.	Complete information about Hi-Mo will be furnished upon request.

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(Concluded from p. 142)

Va. Institute address: 3648 Euclid Ave., Cleveland. Secretary: James D. Eggers.

May 4-8, Electrochemical Society Inc.: Semi-annual meeting, Benjamin Franklin Hotel, Philadelphia. Society address: 235 W. 102nd St., New York 25. Secretary: Dr. Henry B. Linford.

May 5-6, Stanford Research Institute: National air pollution symposium, Huntington Hotel, Pasadena, Calif. Institute address: 612 S. Flower St., Los Angeles 14. Chairman: Dr. A. M. Zarem.

May 5-7, Automotive Engine Rebuilders Association: Spring meeting, Hotel Plaza, San Antonio, Tex. Association address: 419 N. Capitol Ave., Indianapolis, Ind. Executive vice president: R. G. Patterson.

May 5-7, American Mining Congress: Annual spring meeting, Netherland Plaza Hotel, Cincinnati. Congress address: 1102 Ring Bldg., Washington 6. Secretary: Julian D. Conover.

May 6-8, National Highway Users' Conference: Highway transportation congress, Washington. Conference address: National Press Bldg., Washington 4. Director: Arthur C. Butler.

May 6-9, Scientific Apparatus Makers Association of America: Annual meeting, Edgewater Beach Hotel, Chicago. Association address: 20 N. Wacker Drive, Chicago 6. Secretary: Kenneth Anderson.

May 7-9, Industrial Waste Conference: Purdue Memorial Union, Purdue University, E. Lafayette, Ind. Secretary: Prof. Don E. Bloodgood, Sanitary Engineering Dept.

May 7-10, National Screw Machine Products Association: Annual spring meeting, Hotel Chase, St. Louis. Association address: 2860 E. 130th St., Cleveland. Executive secretary: Orrin B. Werntz.

May 8-9, The Wire Association: Spring meeting, William Penn Hotel, Pittsburgh. Association address: 453 Main St., Stamford, Conn. Executive secretary: Richard E. Brown.

May 8-9, National Association of Sheet Metal Distributors: Spring meeting, William Penn Hotel, Pittsburgh. Association address: 1900 Arch St., Philadelphia 3. Executive secretary: Thomas A. Fernley Jr.

May 8-9, American Institute of Mining & Metallurgical Engineers: Northwest metals and minerals conference, Davenport Hotel, Spokane, Washington. Publicity director: W. S. Patterson, Kaiser Aluminum & Chemical Corp., Spokane 10.

May 11-14, American Institute of Chemical Engineers: Annual spring meeting, French Lick Springs Hotel, French Lick, Ind. Institute address: 120 E. 41st St., New York 17. Secretary: Stephen L. Tyler.

May 11-14, Industrial Furnace Manufacturers Association: Annual meeting. The Homestead, Hot Springs, Va. Association address: 420 Lexington Ave., New York 17. Secretary: V. P. Gopcevic.

May 12-14, Liquefied Petroleum Gas Association Inc.: Annual meeting and exhibit, Palmer House, Chicago. Association address: 11 S. LaSalle St., Chicago 3. Secretary: Arthur C. Kreutzer.

May 14-15, National Industrial Conference Board: Spring conference, Waldorf-Astoria Hotel, New York. Address: 247 Park Ave., New York 17. Assistant director, conference division: (Mrs.) I. E. Brown.

May 14-16, American Leather Belting Association: Spring meeting, Skytop Lodge, Skytop, Pa. Association address: 320 Broadway, New York 7. Secretary: E. R. Rath.

May 14-16, Society for Experimental Stress Analysis: Spring meeting, Hotel Lincoln, Indianapolis. Society address: Box 168, Cambridge, Mass.

May 18-21, Copper & Brass Research Association: Annual meeting and exhibit, The Homestead, Hot Springs, Va. Association address: 420 Lexington Ave., New York 17. Secretary: Bertram B. Caddle.

May 19, Rail Steel Bar Association: Annual meeting. General Brock Hotel, Niagara Falls, Ont. Association address: 38 S. Dearborn St., Chicago 3. Secretary: W. H. Jacobs.

May 19-20, American Steel Warehouse Association Inc.: Annual meeting, Waldorf-Astoria Hotel, New York. Association address: 442 Terminal Tower, Cleveland 13. President: Walter S. Doxsey.

May 19-21, National Industrial Distributors Association: Annual meeting, Atlantic City, N. J. Association address: 1900 Arch St., Philadelphia 3. Secretary: H. R. Rinehard.

May 19-21, American Supply & Machinery Manufacturers Association: Annual convention and conference booth activity, Hotel Traymore, Atlantic City, N. J. Association address: 731-732 DuPont Circle Bldg., Washington. General manager: R. Kennedy Hanson.

May 20-21, Nuclear Energy Conference: Michigan State College, E. Lansing, Mich. Program chairman: D. J. Renwick, Mechanical Engineering Dept.

May 21-22, American Iron & Steel Institute: Annual meeting, Waldorf - Astoria Hotel, New York. Institute address: 350 Fifth Ave., New York 1. Meeting director: Frank Ragland.

May 21-23, Gas Appliance Manufacturers Association: Spring meeting, The Broadmoor, Colorado Springs, Colo. Association address: 60 E. 42nd St., New York. Secretary: H. Leigh Whitelaw.

May 22-23, American Coal Sales Association: Annual convention, The Homestead, Hot Springs, Va. Association address: 1625 Eye St., Washington 6.

May 22-24, American Society for Quality Control: Annual meeting & exhibit, War Memorial Auditorium, Syracuse, N. Y. Society address: 70 E. 45th St., New York 17. Secretary: Alfred L. Davis.

May 25-28, National Association of Purchasing Agents: Annual international convention & exposition, Convention Hall, Atlantic City, N. J. Association address: 11 Park Place, New York 7. Executive secretary: George Renard.

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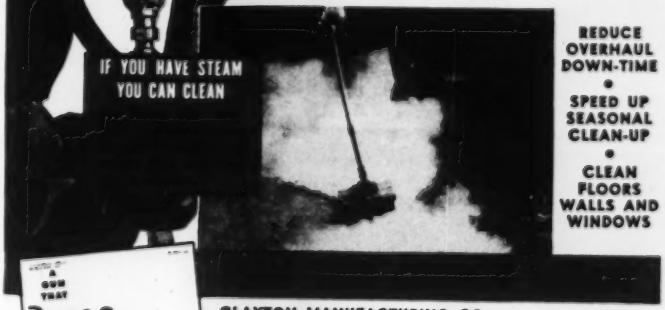
Quickly and easily connected to any ¾", 60 p.s.i. steam outlet, the portable Clayton Hydro Steam Cleaner provides a heavy-duty cleaning and sterilizing system. It employs steam to pick up, mix and deliver a driving spray of properly balanced cleaning or sterilizing solution at controlled pressures and temperatures. *Where it hits, it's clean.* The toughest cleaning job is completed more thoroughly in one quarter the time required by obsolete hand cleaning methods. Mail the coupon for a FREE, convincing demonstration in your own plant.



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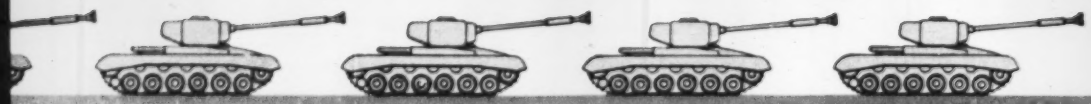

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In the present emergency, just as during World War II, we are again the key producer and coordinator for a vast armor plate program. As allies in a common endeavor twenty companies have joined forces with us. In normal times many of these companies, under our American system of free enterprise, were frequently in competition. Now they have pooled their resources to speedily fulfill the urgent needs of the defense program.

Increasing demand for armor plate plus our known record of achievement in the past resulted in the request by the Government that we bring together a group of companies sufficiently large and having the necessary facilities to make armor plate for tanks and armored vehicles.

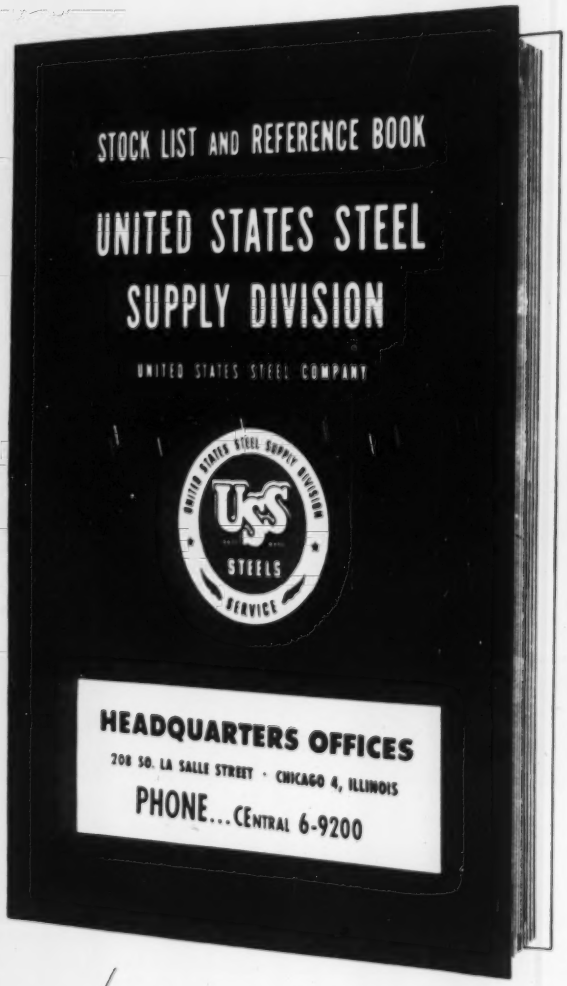
Starting from scratch in November 1950, a multitude of plants who might qualify were screened; their organizations, equipment, labor supply and locations analyzed. This great arsenal of twenty fully equipped and staffed armor plate production units has been the result.

From our armor plate headquarters, centrally located in Detroit, we guide the activities of our associates, work in close contact with procurement, engineering, production and inspection.

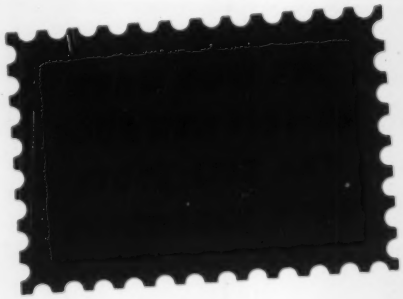
Now an ever increasing flow of flat or formed, fully machined parts is reaching prime contractors. This is our way—the American way to build the armored might that will withstand any challenge in the future.

Standard Steel Spring Company

ARMOR PLATE DIVISION • PENOBSCOT BLDG. • DETROIT, MICHIGAN



FOR QUICK, ACCURATE STEEL SELECTION



- This easy-to-use, illustrated steel guide is packed with useful information and features:
- A list of steel, tool and machinery stocks with specifications and technical data on all steels including alternate and tentative standard steels.
- Descriptions of applications of Alloy, Stainless and Carbon Steels plus a tubular product chart showing all types with characteristics and applications of each.
- Comprehensive reference charts and tables as well as 16 tabs for quick product reference and color sections for special products.

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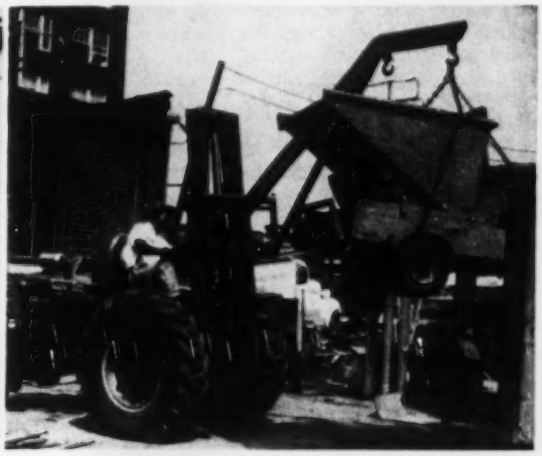
. . . adapted to handling irregularly-shaped materials



MACHINE HELPS ANSWER PROBLEMS OF OUTSIDE STORAGE
. . . combines tractor-lift types for operation over rough ground

Mobile Crane Truck Line

USE REPLY CARD—CIRCLE No. 1

Line of mobile crane trucks in 6000 and 10,000-pound capacities is announced by Baker Industrial Truck Division, Baker-Raulang Co., 1230 W. 80th St., Cleveland, O. Machines are adapted to handling heavy castings, machinery, bar stock, sheet metal packs or other irregularly-shaped material. They work in and out of flat, gondola or box cars. Combining travel, hoist, boom and slew motions in a single unit, trucks can supplement overhead cranes by working in areas not served by such equipment.

Model CXB, 6000 pounds capacity at 7-foot radius, uses an 18-cell lead or 30-cell alkaline battery rating 550-700 amp-hour. Second model, type CXF, has 10,000 pounds capacity at 5½-foot radius. It uses 24-cell lead or 42-cell alkaline battery rating 550-700 amp-hour. Both have 19-foot telescoping booms.

Table Model Tester Redesigned

USE REPLY CARD—CIRCLE No. 2

Redesigned model of its Baldwin-Sonntag SF-2 fatigue machine is announced by Baldwin-Lima-Hamilton Corp., Philadelphia 42, Pa. Table model SF-2 is the smallest of five standard models developed for alternating force capacity from 25 to 10,000 pounds or from 50 to 20,000 pounds in one direction only. Maximum travel of loading yoke is ½-inch; testing speed is 1800 cycles per minute. Maximum load capacity is increased 25 per cent and redesigned machine can make simulated service tests on small parts where originally it was limited to sheet metal specimens.

Another feature is an accessory preload attachment that becomes a part of the machine when desired. Attachment permits applying preload in either up or down direction. Model is driven by a ¼-hp synchronous motor, has dial load indicator graduated in 0.125-pound increments, and a cycle counter. Cage guided by flexure plates that absorb horizontal components of centrifugal force is provided. Tension-compression spring for inertia force compensation provides another feature.

REPLY CARDS

on page 167 will bring you more information on any new products and equipment in this section.

Heavy-Duty Tractor-Type Lift

USE REPLY CARD—CIRCLE No. 3

Tractor-type lift, introduced by Tracto-Lift Co., 2011 Baltimore, Kansas City 8, Mo., is designed to help answer problems of outside storage. Machine combines operating characteristics of a tractor with lifting power of a fork truck to operate over rough or sandy ground. Large tires are installed in the front to give maximum flotation and traction. Standard steering is improved and counterweights added to the rear to give required stability in handling heavy loads.

Lift is available in four sizes having capacities of 3000, 4000, 5000 and 6000 pounds. Fork lengths vary from 30 to 60 inches and lifting heights extend to 12 feet-6 inches. Minimum underneath clearance is 8 inches on small or medium sizes; 10 inches on the larger models. Complete line of attachments is available.

Low-Silhouette Power Exhauster

USE REPLY CARD—CIRCLE No. 4

Upblast power exhauster with low silhouette is announced by Gallaher Co., 4108 Dodge St., Omaha 3, Neb. Largest model has a certified rating of 22,000 cfm and is 54 inches high. Smaller models range down to a 42-inch height at 10,250 cfm. Low silhouette development

is designed to cut down overturning effect.

Cast aluminum alloy fan blades are made in air foil design. Blades are available for field replacement without purchase of complete wheel. Motors are totally enclosed, standard types, but direct current and special voltage models can be made on order.

Pneumatic Grinders Introduced

USE REPLY CARD—CIRCLE No. 5

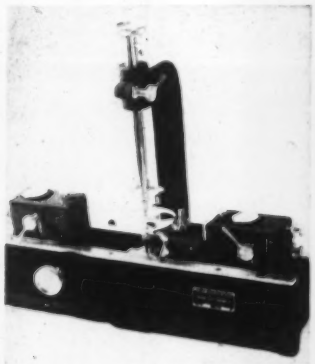
Two compact pneumatic grinder models, designed for production grinding and finishing, are introduced by Mall Tool Co., 7725 S. Chicago Ave., Chicago 19, Ill. Exhaust of the smaller model directs air away from the operator toward wheel to cool and clean work. Noise silencer eliminates high-pitch tones present in most air tools. Tool gains versatility through potential use with numerous accessories. Weight is 18 ounces; overall length, $5\frac{1}{4}$ inches.

Second grinder, No. PGK2122L, is a heavy-duty tool for accuracy and large grinding jobs. Cited as particularly effective is its work in rotary filing on aluminum and magnesium castings. Weight of this model is $1\frac{3}{4}$ pounds. Grinder is powered by a 4-vane rotary varispeed motor.

Adapter Improves Gear Checker

USE REPLY CARD—CIRCLE No. 6

Development of an adaptor and attachment for its gear checker is announced by Orlandi Gear & Machine Co., 16195 Meyers Rd., Detroit 27, Mich. Adaptor is made to simplify setup for checking helix angle and its use indicates substantial reduction of mathematical



. . . eases setup for checking helix angle

computation. Gage block size required for setup is determined by taking sine of the helix from the trig table, subtracting one-half the diameter of adaptor pin and adding net result to the constant. Rolling attachment for use with master gear makes possible rapid check of pitch diameter and concentricity accurate to 0.0001-inch. With this attachment, backlash can also be checked with mating or master gears.

Air-Feed Machine Marks Shells

USE REPLY CARD—CIRCLE No. 7

Complete air-feed and ejector assembly is combined with motor-driven marking machine in a complete unit offered by Acromark Co., 398 Morrell St., Elizabeth, N. J. Machine is made for marking cylindrical parts, such as shells, cartridges, drills and shafts. Parts are conveyed to the machine and rolled into feeding position down a gravity chute. At each stroke of

Good for many years at hard labor

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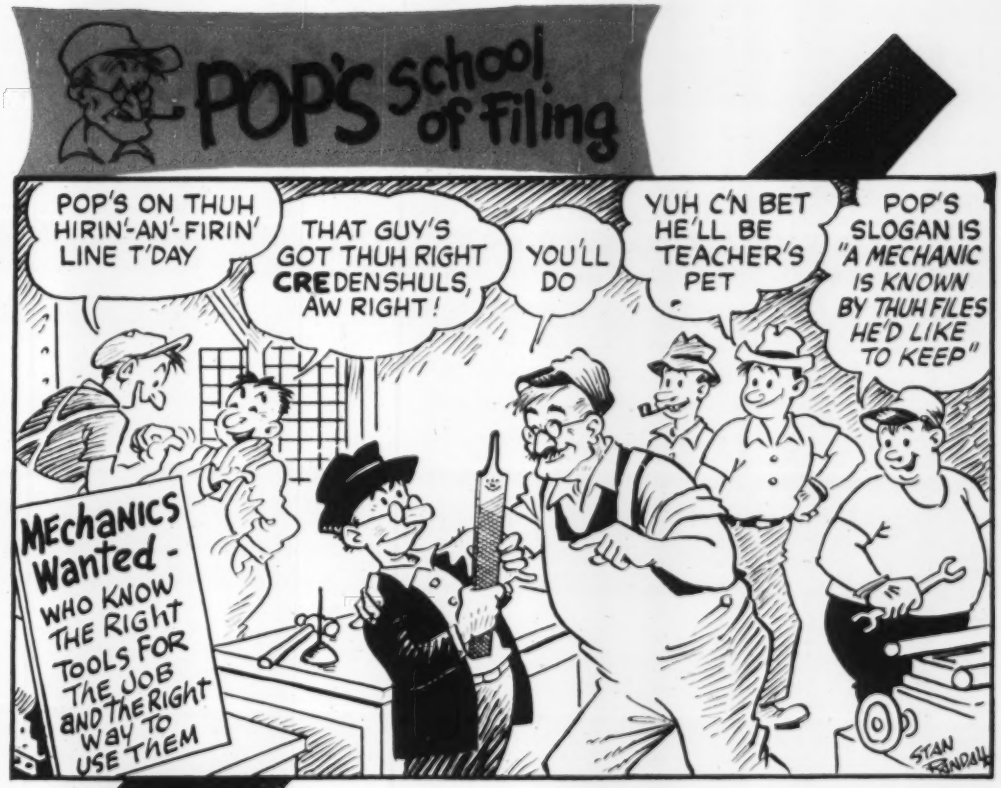
POP'S school of Filing
POP'S ON THUH HIRIN'-AN'-FIRIN' LINE T'DAY
THAT GUY'S GOT THUH RIGHT CREDENSHULS, AW RIGHT!
YOU'LL DO
YUH C'N BET HE'LL BE TEACHER'S PET
POP'S SLOGAN IS "A MECHANIC IS KNOWN BY THUH FILES HE'D LIKE TO KEEP"
MEchanics Wanted - WHO KNOW THE RIGHT TOOLS FOR THE JOB AND THE RIGHT WAY TO USE THEM
STAN RANDALL

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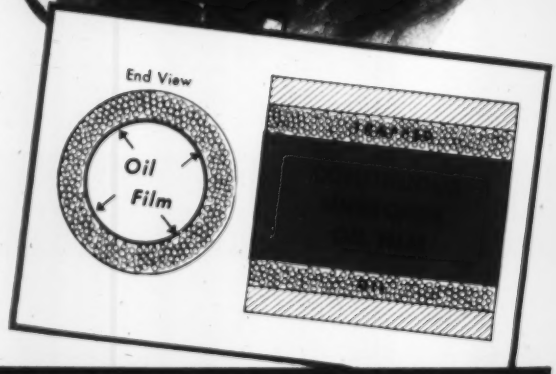

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Oilite Products include:
BEARINGS, Finished Machine Parts, Cored and Solid Bars, Permanent Filters and Special Units in both **NON-FERROUS** *and* **FERROUS** *Metals*

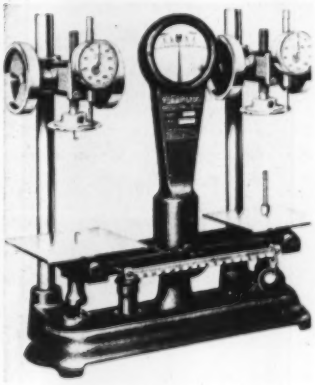
the machine an automatic air valve releases a plunger that pushes the part into exact marking position. Succeeding part pushed into position automatically ejects the one just marked.

This automatic operation permits placing the marker on a continuous production line where conveyors can carry marked parts away. Machine, called model **9AMA**, has gear reduction motor furnished for 110-220 v, 60 cycle ac connection.

Spring Testing Machine

USE REPLY CARD—CIRCLE No. 8

Closer control in production of coiled springs is attributed to a spring testing machine designed by Torrington Mfg. Co., Torrington, Conn. Tester is made as a companion to the company's spring coilers, measuring springs under



. . . closer control in coil production

conditions similar to final usage. Its use, beyond primary load testing, includes determining spring gradient, checking free height in relation to load and gaging effect of wire size on load. In addition, it measures initial tension in extension springs and can be used for checking effect of heat treating and plating.

Machine is essentially an even balance weighing scale mounted on a base, with sponge rubber pad underneath to minimize vibration. Scale has a built-in dashpot to dampen oscillation of pointer and pans while testing. Standards mounted behind the weighing pan support spring length measuring devices. Two models are produced:

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Union Chain's Performance Story

PART · II

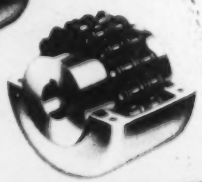
HOW UNION CHAIN MANUFACTURES

Since Union Chain concentrates all its efforts on the production of steel chains, sprockets and attachments, it has been able to make important advances in designing, manufacturing and testing. The resulting superiority of performance can also be attributed to the meticulous accuracy with which both conventional and *extra exclusively Union* manufacturing operations are executed.

UNION ROLLER CHAIN

UNION HEAVY DUTY CHAIN

UNION SILENT CHAIN FLEXIBLE COUPLING



UNION ROLLER CHAIN FLEXIBLE COUPLING

Part I - How UNION CHAIN *Specializes*

Union Chain manufactures nothing but sprocket chains, sprockets and attachments. Not only that—Union Chain is the only manufacturer producing every type of steel sprocket chain *exclusively*. Such specialization is the reason Union Chain consistently produces chains of the finest quality for every possible application.

Part III - How UNION CHAIN *Recommends*

There is no need for Union Chain to recommend any chain but the right one — since Union Chain makes every type. Moreover, wide experience with every type of chain makes a recommendation from Union Chain's engineering staff a valuable one.

Part IV - How UNION CHAIN *Distributes*

Direct Factory Representatives are located in most industrial cities to provide a two-way communication service between customer and factory. See list at right—as well as list of Stock Carrying Distributors.*

* At the present time there is a heavy demand for many types of chain. Consequently, our distributors are not always in a position to fill all orders from stock.

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B. Nelson
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Indianapolis 20, Indiana

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New Orleans 15, Louisiana

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Newton Highlands 61, Mass.

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Allied Belting & Trans. Co
2614 Sylvan Ave.
Dallas, Texas

Beacon Supply Co., Inc.
1825 Washington Ave.
Houston 10, Texas

Bearing Specialists Co.
2902 Texas
Lubbock, Texas

El Paso Machine Works, Inc.
1600 E. 4th St.
El Paso, Texas

Great Western Supply Co.
14th & Throckmorton
Fort Worth, Texas

R. B. Hayes Machinery Co.
Marshall, Texas

Lloyd Electric Co.
511 El Paso St.
San Antonio, Texas

Overton & Binns, Inc.
1307 Indiana
Wichita Falls, Texas

VIRGINIA
Blue Ridge Hardware & Supply Co.
Bassett, Virginia

Mill Supplies Corp.
South Norfolk, Virginia

WASHINGTON
Electric Steel Foundry
1327 Washington St.
Spokane, Washington

WEST VIRGINIA
Park Engineering Sales Co.
2391 Dudley St.
Parkersburg, W. Virginia

Bluefield Hardware Co.
Bluefield, W. Virginia

Smith Steel Supply Co.
130 Peninsula St.
Wheeling, W. Virginia

WISCONSIN
Dale Industrial Supply Co.
528 Forest St.
P. O. Box 867
Wausau, Wisconsin

Richard E. Ela Co.
744 Williamson St.
Madison, Wisconsin

The Union Chain and Manufacturing Company • Sandusky, Ohio, U.S.A.

TRANSMIT POWER
UNION CHAINS
CONVEY MATERIALS

ATTACHMENTS • SPROCKETS • FLEXIBLE COUPLINGS • FOR ALL INDUSTRIES

ARE YOUR ELECTRIC TRUCKS GUILTY OF "4 O'clock Letdown?"

READY-POWER DRIVE

for Full Efficiency ALL THE TIME!

Only Ready-Power gives your electric trucks full efficiency for every minute of every hour . . . all day long. And because Ready-Power-equipped trucks are so easy to operate, drivers are more efficient, too. Unlimited power plus alert drivers add up to more ton-miles per hour.

Remember . . . Your Truck Is No Better Than Its Power

CONTINUOUS-DUTY POWER UNITS

The READY-POWER Co.

3824 Grand River Ave., Detroit 8, Michigan

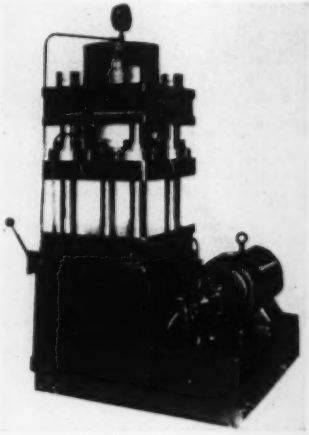
Manufacturers of Gas and Diesel Engine-Driven Generators and Air Conditioning Units, Gas and Diesel-Electric Power Units for Industrial Trucks

First measures a load to nearest 0.01-ounce, to 3-pound capacity; second measures load to nearest 0.5-ounce, to 16-pound capacity.

Hydraulic Press Line Added

USE REPLY CARD—CIRCLE No. 9

Oilpower Engineering Co., 1067 Davis Terrace, Schenectady 3, N. Y., introduces a line of hydraulic presses for hobbing and closed die forging. Presses are of four-column design, all-welded steel construction. They are made for 100 to 1000 tons capacity.



. . . for hobbing and closed die forging

On the 400-ton model, bed working area is 20 x 25 inches; ram stroke is 12 inches; and daylight, 16 inches. Press is powered by a 10 hp motor. Down-moving, double-acting cylinder is forged steel, controlled by a compact four-way valve, developed by the company for this application.

Insulator Washing Equipment

USE REPLY CARD—CIRCLE No. 10

Preakness Inc., 972 Broad St., Newark 2, N. J., introduces line insulator washing equipment suitable for washing insulators to reduce flash over. Apparatus consists of a skid-mounted water tank of varying capacities, a gasoline driven high pressure water pump, movable boom fitted with handles and high pressure hose. Equipment applies water stream to insulators in an instantaneous jet action through its special fluted discharge nozzle. Operation is secured by driving

UNITED 16" & 49" x 68"—4-High Sheet Mill

UNITED SHEET MILLS

UNITED mills of the type illustrated are widely used in the cold reduction of both ferrous and non-ferrous metals.

We are now building two similar mills for rolling stainless steel.

Designs of these new units are available for duplication; or they may be modified to suit your requirements.

Why not ask our engineers for further particulars.

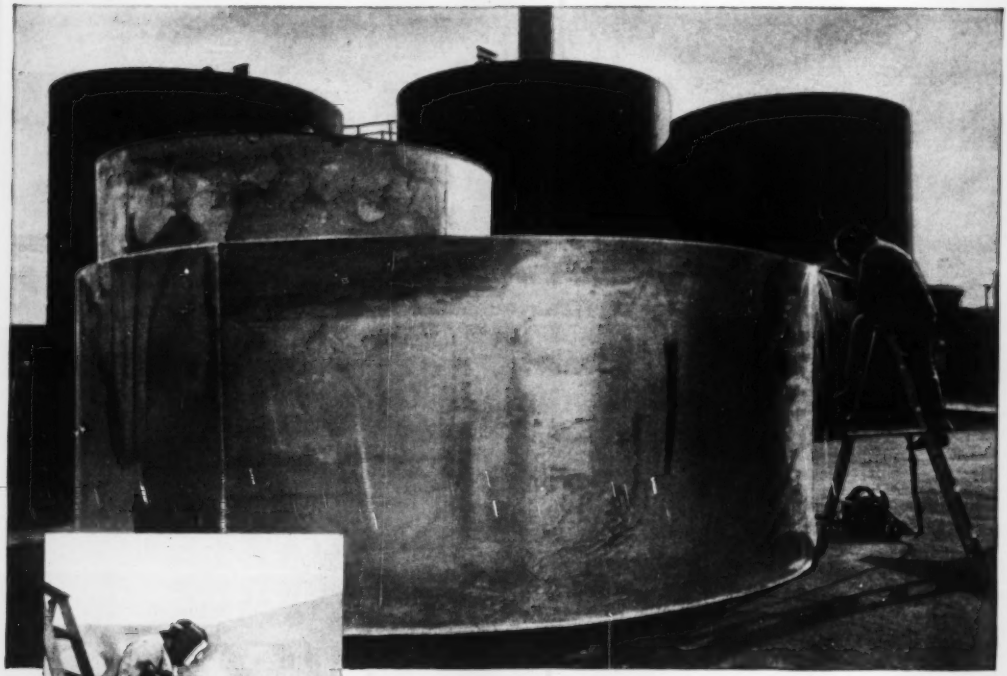
UNITED ENGINEERING AND FOUNDRY COMPANY

PITTSBURGH, PENNSYLVANIA

Plants at **PITTSBURGH • VANDERGRIFT • NEW CASTLE • YOUNGSTOWN • CANTON**

Subsidiaries: Adamson United Company, Akron, Ohio
Lobdell United Company, Wilmington, Delaware
Stedman Foundry and Machine Co., Inc., Aurora, Indiana

Designers and Builders of Ferrous and Nonferrous Rolling Mills, Mill Rolls, Auxiliary Mill and Processing Equipment, Presses and other Heavy Machinery. Manufacturers of Iron, Nodular Iron and Steel Castings, and Weldments.



One welder. One helper. The Aircomatic Welding Process . . . and Universal Copper Works, Inc. Newark, N. J. fabricates a 50,000 gallon aluminum industrial acid tank for A. Gross & Company at a savings of 75% in filler rod and 50% in time over previous methods used.

AIRCOMATIC® WELDING *cuts costs of* "Hungry Acid" Tanks

Experts long knew aluminum was the answer for 'hungry acid' storage tanks . . . acetic, fatty acids, for example. Only a few years ago fabrication of these ideal tanks was a sizable problem.

Today that's all changed. Air Reduction's Aircomatic Welding Process has so simplified tank-building operations, that in-the-field construction has become routine practice.

Based on continuous feeding of bare filler wire in conjunction with inert shielding gases, the Aircomatic Process now presents the welder with these fabrication advantages:

1. Continuous, high-rate deposition of filler metal
2. Semi-automatic, all-position welding
3. Minimum plate-edge preparation
4. Heavy section welding with little or no preheat
5. No flux — elimination of slag removal
6. Visible arc — no blind welding

Find out how you can use Aircomatic welding. Write or phone your nearest Airco office. Ask for your copy of Catalog 17 "The Aircomatic Process". Also, inquire about Airco's film "The Tool for the Job" — the story of Aircomatic in full color.

AT THE FRONTIERS OF PROGRESS YOU'LL FIND

AN AIR REDUCTION PRODUCT

AIRCO®

DEALERS AND OFFICES IN PRINCIPAL CITIES

AIR REDUCTION

AIR REDUCTION SALES COMPANY • AIR REDUCTION MAGNOLIA COMPANY • AIR REDUCTION PACIFIC COMPANY

REPRESENTED INTERNATIONALLY BY AIRCO COMPANY INTERNATIONAL

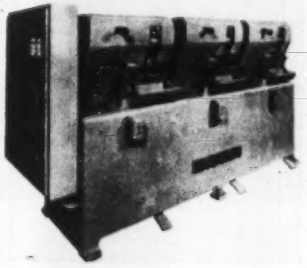
DIVISIONS OF AIR REDUCTION COMPANY, INCORPORATED

the chassis into position near the pole holding insulators, elevating the boom and opening the water valve for about 6 seconds.

Tool Chamfers Hypoid Pinions

USE REPLY CARD—CIRCLE No. 11

Line of burring and chamfering machines for hypoid pinion teeth is announced by Modern Industrial Engineering Co., 14230 Birwood, Detroit 4, Mich. Patented features include simultaneous chamfering on the acute side and removal of burrs and sharp edges on the profile. Pushbutton simplicity of operation with safety interlocks and automatic gaging avoid necessity of judgment on the part of operator. Universal character is afforded



. . . simultaneous chamfering on acute side

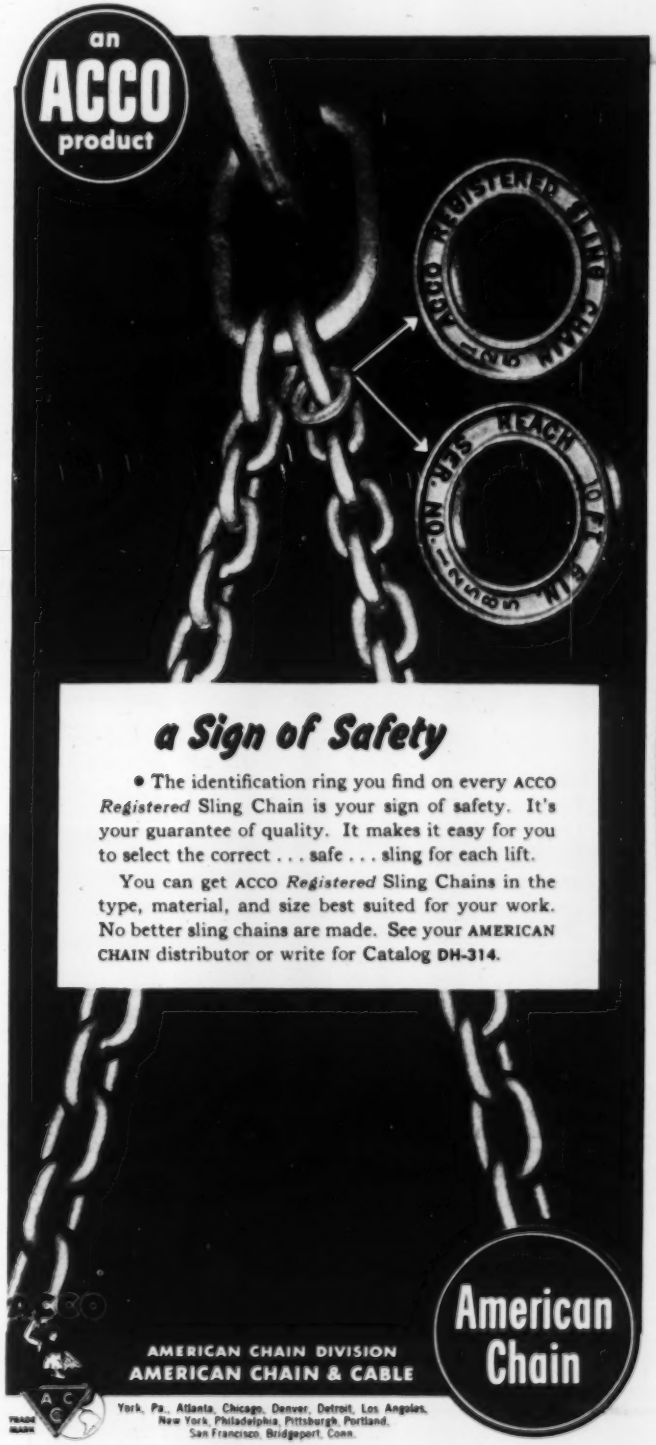
through a simple changeover for pinions of different tooth numbers and diameters.

Model 2041 Burr-Master, a three station machine, can chamfer three hypoid pinions of different dimensions simultaneously—one in each station. The three stations are identical except for detail tooling assemblies and ratio of quickly accessible change gears. Maximum operating rate reaches 300 complete hypoid pinions per hour from each station.

Staking Press Model Improved

USE REPLY CARD—CIRCLE No. 12

Improved version of its model RR-6B staking press is announced by Winter Products Inc., Box 3112 Barnum Station, Bridgeport, Conn. The company indicates a 50 per cent increase in operating speed is possible on its redesigned model. Press is capable of 100 or more strokes per minute. Built-in quick-exhaust valve and simplified air ejection system removes work au-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ACCO
product
a Sign of Safety
• The identification ring you find on every ACCO Registered Sling Chain is your sign of safety. It's your guarantee of quality. It makes it easy for you to select the correct . . . safe . . . sling for each lift.
You can get ACCO Registered Sling Chains in the type, material, and size best suited for your work. No better sling chains are made. See your AMERICAN CHAIN distributor or write for Catalog DH-314.
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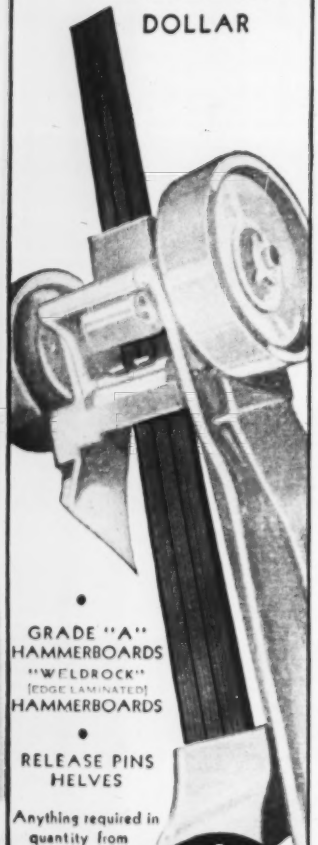
AMERICAN CHAIN & CABLE
York, Pa., Atlanta, Chicago, Denver, Detroit, Los Angeles, New York, Philadelphia, Pittsburgh, Portland, San Francisco, Bridgeport, Conn.
American Chain

IRWIN

MORE FORGINGS *per* HAMMERBOARD DOLLAR



• GRADE "A" HAMMERBOARDS
"WELDROCK" [EDGE LAMINATED] HAMMERBOARDS
• RELEASE PINS HELVES

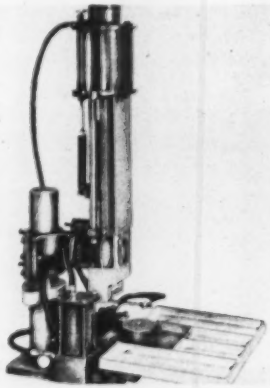
Anything required in quantity from Pennsylvania's hard woods—maple and cherry

IRWIN 50 YEARS of Quality

IRWIN MANUFACTURING CO., INC.
GARLAND, PA.

The largest stock of air dried hard woods in Northwestern Pennsylvania

tomatically from the lower die. Like earlier models, it is a bench-mounted unit for light staking, forming and other secondary-press work. Press can deliver a controlled impact from 0 to 12,000 pounds or a squeeze up to 12 times airline pressure. Stroke can be set



. . . operating speed increased 50 per cent

for 1 or 2 inches. For operator protection, two-hand safety control is included.

Introduced with the press is the model 300 slide feed with built-in hydraulic speed control. Optional feed has a 2 or 3-inch stroke, adjustable as is necessary; adjustable air blow-off for work; and safety guard for operator protection.

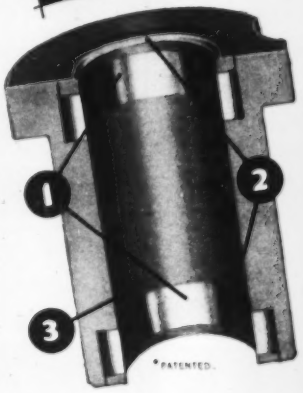
Fan Louvers Move Automatically

USE REPLY CARD—CIRCLE No. 13

Roof-type ventilator that moves maximum volume of air in 5000-45,000 cfm range is offered by Tripar Products Inc., 14641 W. Eleven Mile Rd., Royal Oak, Mich. Mechanically-actuated louvers open fully and automatically the instant the fan is started. Power for opening is provided by the fan drive motor through lever-clutch mechanism. When fan is stopped, louvers close immediately and lock in position until the unit is again actuated.

Exhaust air discharges upward to protect roof from damage by fumes or moisture removed from plant. Standard sizes are 24 to 48 inches. Special sizes, top or bottom motor mountings or belt-driven units for use in corrosive atmos-

DOES IT BETTER! AND LONGER!



MEYCO
CARBIDE INSERTED
DRILL JIG BUSHINGS

There are three simple reasons why MEYCO Carbide Inserted Bushings have won an enviable reputation for themselves:

1. Cemented tungsten carbide inserts at the points of wear increase the life of the bushings an unbelievably long time.

2. Hardened steel rings above and below the carbide inserts protect both drill and carbide from the shock of impact.

3. Body of hardened special alloy steel, combines the best features of steel bushings with the best features of carbide.

The story is simple: MEYCO bushings last as long as solid carbide bushings in most cases at costs that come close to the prices of ordinary steel bushings. And on top of that—they will increase the life of drills and fixtures, maintain accuracy much longer and solve extra tough production drilling problems. Made to A.S.A. Standards. For full information write for catalog No. 32.

Manufacturers of precision tools since 1888

W. F. MEYERS CO., INC.
BEDFORD, INDIANA

GAYLORD BOXES

Safeguard *Your* Product

All the Way

In your plant everything possible is done to be sure your product is designed and manufactured to please the user. Equally vital is the selection of strong, durable shipping containers to safeguard the product which has been so carefully made.

Select Gaylord . . . the unseen quality of Gaylord Boxes pays off in peace of mind for everyone concerned.

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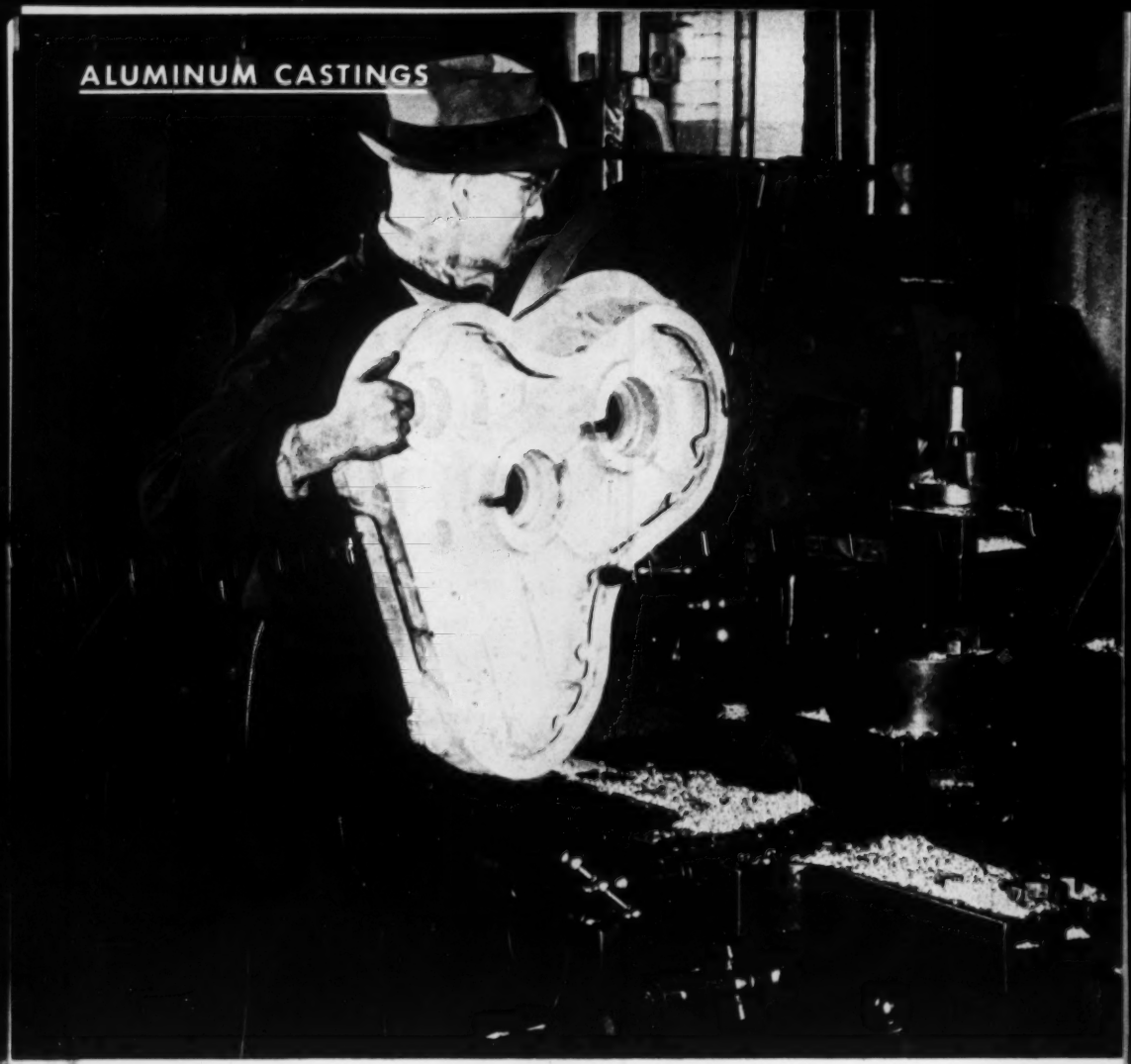
Kansas City • Bogalusa • Milwaukee • Chattanooga • Weslaco • Appleton
New Haven • Hickory • Amarillo • Greensboro • Sumter • Jackson • Miami
Omaha • Mobile • Philadelphia • Little Rock • Charlotte • Cleveland



CASTINGS YOU CAN LIFT WITH EASE

ALCOA makes four kinds in aluminum—sand, plaster, permanent-mold and die

You don't have to look farther than your own shop to see the advantages of castings that weigh one-half, even two-thirds, less. Think how often castings are lifted while being machined, finished, assembled, and shipped. The savings in man power with aluminum castings are impressive.

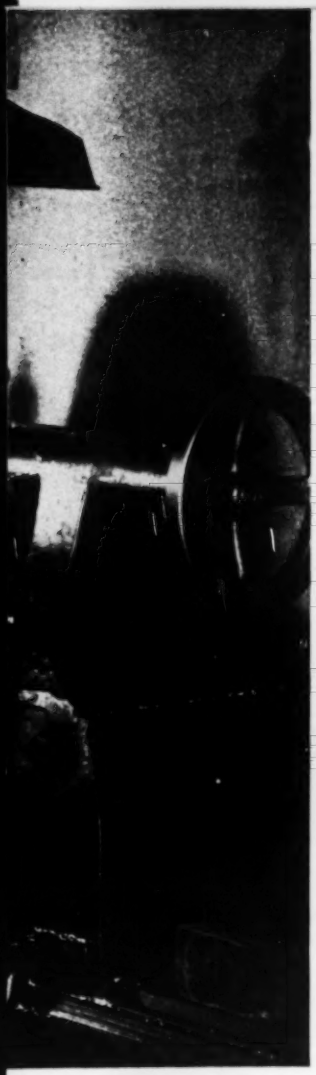
Look, too, at the other commercial advantages of Alcoa Castings. Ease of machining. Corrosion resistance. High conductivity of heat and electricity.

How about price? Alcoa Castings are competitive with castings of many other metals. Their cost, finished and assembled in your product, often amounts to surprising savings over heavy metals.

We have been making aluminum castings for 41 years. We have been working with aluminum for 64 years. To aluminum's natural advantages, we add the extra measure of sound and skillful design help. Any of our four foundries or two die-casting plants, located from coast to coast, are open for your inspection. Contact your local Alcoa Sales Engineer, listed under "Aluminum" in the classified phone book.

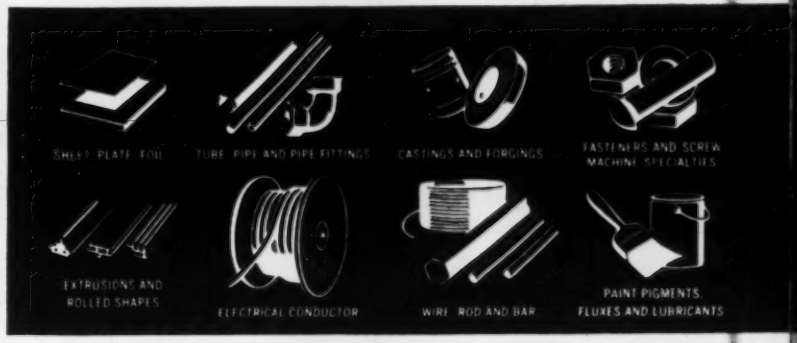
ALUMINUM COMPANY OF AMERICA
1902D Gulf Building • Pittsburgh 19, Pa.

ALCOA



High production of permanent-mold castings in Alcoa's Cleveland foundry is illustrated by this automatic machine for making pistons.

Dimensional check of a completed die in Alcoa's die-casting plant at Chicago.



Remember, ALCOA makes "everything" in aluminum

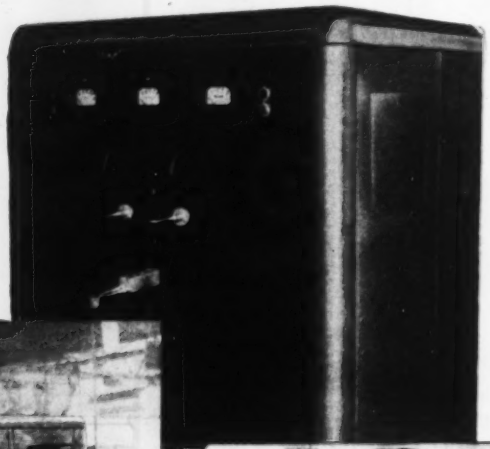
While the sale of our products is limited by government regulations, you'll find no limitations on help in design, application, or fabrication.

Typical castings made by Alcoa. 1. Permanent-mold washing machine agitator. 2. Sand-cast machine part. 3. Die-cast electric iron soleplate. 4. Plaster-cast automotive torque converter.

Setting a die in a large die-casting machine at the Chicago plant.

A line of automatic molding machines, indicating the high production capacity for sand castings at Alcoa's Bridgeport, Conn., foundry.

AT WENDT-SONIS A LINDBERG INDUCTION HEATING UNIT



ups tool tip brazing 135% . . . replaces two units

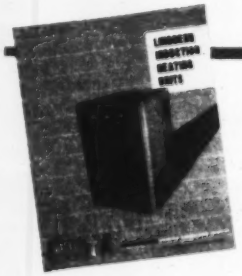
Production brazing of carbide tip tools has soared from 270 to more than 600 an hour since Wendt-Sonis, Hannibal, Mo., tool manufacturer, installed a Lindberg induction heating unit.

Two operators, fluxing parts and putting brazing metal and carbide tool tips in place, load the assemblies on a conveyor belt that passes a continuous stream of work through a specially designed, long hair-pin type heating coil.

Production is speeded because 14 tool assemblies . . . not just one . . . are in the heating field at any given time. The first tool on the conveyor passes *from* the heating area, leaving 13 others *still in* the field of heat, with tool number 15 *just entering* the coil area.

Production, formerly through two smaller units, totalled only 135 tools per hour, per unit, and required four operators. Thus the new equipment frees two operators for other important work.

If your requirements call for production brazing, soldering, hardening, annealing, stress relieving, hot forming, forging or shrink fitting, a Lindberg induction heating unit can better your production picture . . . minimize costs . . . increase profits.



Ask for a copy of Bulletin 1440. It pictures and describes standard models . . . illustrates 11 cost reducing features . . . lists applications . . . shows accessory equipment.

LINDBERG **HIGH FREQUENCY DIVISION**

Lindberg Engineering Company, 2441 West Hubbard Street, Chicago 12, Illinois

pheres are available. Interior and mechanism can be supplied with protective coatings for moisture and corrosion protection.

Precision Casting Furnace

USE REPLY CARD—CIRCLE No. 14

Ajax Electrothermic Corp., Trenton 5, N. J., announces a roll-over type furnace developed for high-speed production of precision castings. The mechanically-operated induction unit transfers molten metal to the mold in any preset

. . . transfers metal to mold in preset cycle

cycle, usually a few seconds. At the end of the melting period, preheated mold or investment is clamped directly to the top of the crucible with a specially-fitted mold holder. Operation of a control lever causes furnace to rotate to pouring position. Molten metal fills the mold at the most desirable pouring rate, helping to insure uniform precision casting.

Furnace is powered by the company's standard 20 kw mercury hydrogen type converter and operates at a frequency of about 30,000 cycles. Converter can power other melting furnaces or equipment for heat-treating and brazing.

Generator Frequency Changers

USE REPLY CARD—CIRCLE No. 15

Motor Generator Corp., Hobart Bros. affiliate, Troy, O., announces a line of motor generator frequency changers in 3, 5 and 10 kw sizes. Applications are found in aircraft instrument testing, functional testing of radio and radar systems, armament, intercommunication systems or any test operation where 400-cycle power is required. Frequency changers can also be used for powering control systems of missiles and rockets.

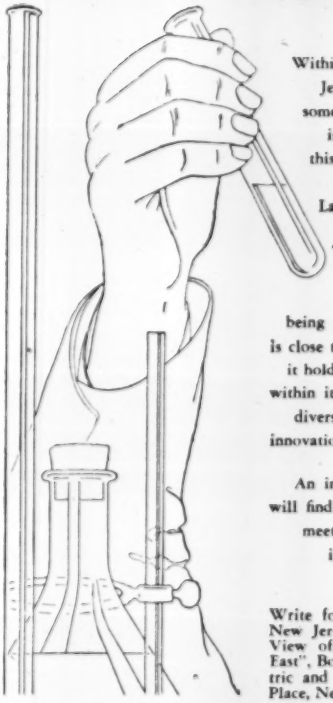
Units are made of two-bearing design. Motor rotor, exciter armature and revolving field are built on a solid steel shaft, dynamically balanced to insure quiet operation without vibration. Monitor top houses all control and components. Control and protecting equipment consists of full voltage magnetic starter with overload protection in the primary circuit and magnetic contactor in the secondary circuit.

Pushes Off Chips

USE REPLY CARD—CIRCLE No. 16

Detroit Milling Cutter Co., Farmington, Mich., introduces a chip remover. It consists of a rotating wire brush on a magnetic base that can be mounted on any hori-

What's New in New Jersey?



Within a highly concentrated area in New Jersey are more than 400 facilities where some kind of research and development is under way. The newest addition to this incubator of industrial activity is the James Forrestal Research Laboratory at Princeton, New Jersey.

There are important reasons why $150,000,000 a year—more than 10% of the nation's research—is being spent in New Jersey. New Jersey is close to home offices in New York City . . . it holds an amazing diversification of industry within its borders . . . and this nearness of diversified plants makes it possible to put innovations into pilot production.

An industrialist moving to New Jersey will find a variety of research facilities to meet the needs of a dynamic, expanding business.

Write for the new digest about New Jersey — "An Industrialist's View of the Crossroads of the East", Box D, Public Service Electric and Gas Company, 76 Park Place, Newark, N. J.

PUBLIC SERVICE

NEWARK, NEW JERSEY

LISTEN to the difference

This Clearing press at Vollrath is making flywheel fans for lawn-mower engines.

It may be strange to think of a metal-forming press as QUIET in operation, but that's what The Vollrath Company of Sheboygan, Wisconsin, think about their Clearings in comparison to their other presses. Since this company has been making the famous Vollrath Ware since 1874, you can be sure they know presses, and are putting proper value on an important consideration.

Their Clearing presses require definitely less maintenance than their other, less quiet presses. That, of course, is the payoff. The Vollrath people know that noisy operation means strain and wear—and ultimate cost. That's why they buy Clearings.

When you buy or specify a press, we suggest you listen to the difference. It's a good way to save money.

CLEARING MACHINE CORPORATION
6499 WEST 65TH STREET ★ CHICAGO 38, ILLINOIS

CLEARING PRESSES

THE WAY TO EFFICIENT MASS PRODUCTION

zontal or vertical milling machine. Wire brush is placed in contact with revolving teeth or blades of milling cutter and pushes off adhering chips.

Unit Pillow Block

USE REPLY CARD—CIRCLE No. 17

An improved unit pillow block with a lubricant retaining DuPont Fairprene red seal, is announced by SKF Industries Inc., Philadelphia 32, Pa. Practically frictionless wiping action of seal against the inner bearing ring is a feature of the Hess-Bright SY unit. Shaft diameters range from 1 3/16 to 2 15/16 inches.

Cutting Carbide

USE REPLY CARD—CIRCLE No. 18

Newcomer Products Inc., Latrobe, Pa., has developed grade C-6 cutting carbide. It is suitable for use on old or slow speed machines and is recommended for interrupted cuts. It removes stock fast because of the heavy feeds permitted.

Cold Strips Coatings

USE REPLY CARD—CIRCLE No. 19

Stripper N, developed by Silver Star Chemical Corp., New York 13, N. Y. is for cold stripping of various types of synthetic coatings from aluminum and its alloys.

Panel Mounting Rack

USE REPLY CARD—CIRCLE No. 20

A panel mounting rack incorporating a mechanism for rapid installation or ejection of control or amplifier panels is made by Aircraft Dept., Westinghouse Electric Corp., Lima, O. Mechanism reduces time and effort required to engage connectors, hold panel securely and to lock it in position.

Copper Coating for Steel

USE REPLY CARD—CIRCLE No. 21

Redskin copper coating, developed by R. H. Miller Co. Inc., Homer 2, N. Y., is an instantane-

USE A **REPLY CARD**
Just circle the corresponding number of any item in this section for more information.

Yours FOR THE ASKING

TEAR OUT CARD, FILL IN and MAIL TODAY!

71. Steel Plate Guide

W. J. Holliday & Co.—Over 15 different special purpose steels along with their physical properties and methods of heat treating, machining, and welding are listed in 8-page buyers' guide 152. Beside abrasion resistant and high tensile plate steels, ground plate, flange and firebox steels, floor plates, gratings and perforated plates are detailed.

72. Rotary Parts Finishing

Roto-Finish Co.—Here is an excellent 16-page illustrated booklet "Precision Finishes Mechanically with Roto-Finish" which tells how the Roto-Finish process puts precision finishing on a mass production basis. Details of equipment used for grinding, deburring, descaling, polishing, Britehoning and coloring are presented. Also, magazine reprints tell experience of two companies using the process and equipment.

73. Carbide Tipped Tools

Super Tool Co.—For the specifications and other information on standard tools tipped with Carboloy, Kennametal and other leading carbides, you should get a copy of supplement No. 5 to catalog No. 50. Tools for turning, facing threading and boring are included, as are dimensional diagrams.

74. Nylon Lined Bearings

Thomson Industries, Inc.—Operating principles, design, advantages and applications of Nylined (nylon lined) bearings are covered in detail in 4-page illustrated bulletin. Intended for rotation or reciprocation, bearings require no lubrication, have low friction and wear and are abrasion, heat and chemical resistant.

75. Hydraulic Pump/Motor

Denison Engineering Co.—Detailed engineering and operational data pertinent to the HydrOILic single stage, vane type, dual purpose pump/motor is contained in 8-page bulletin P-5. Used as pump, unit offers 2000 psi for continuous duty operation and delivery up to 70 gpm. As a motor, it provides high stalled torque ratings of 13 to 257 lb-in. per 100 psi. Typical porting combinations are tabulated as are pump and fluid motor operating characteristics. Eight dimensional drawings cover over 20 models.

76. Electric Power Drives

Sterling Electric Motors, Inc.—You will find descriptive information on variable speed drives, geared motors and constant normal speed motors in this 20-page illustrated catalog No. 174 "Sterling Electric Power Drives." Units are offered in dripproof, splashproof, totally enclosed and pipe ventilated designs.

77. Hot Topping Compound

United States Graphite Co.—Mexatop, a hot topping compound for ingot heads and casting risers, is subject of illustrated folder. Due to its good insulating properties, product follows closely the contour of shrinking metal and provides maximum protection throughout cooling cycle. This action promotes formation of cup-shaped shrink cavity indicative of efficient metal feeding.

78. Metal Abrasives

Western Metal Abrasives Co.—Information contained in question and answer form in 16-page booklet "A Primer on the Use of Shot and Grit" will serve as guide in examining your problems and give you a yardstick against which you can measure any metal abrasive on the market.

79. Chamfering Machine

Modern Industrial Engineering Co.—You'll find complete description, method of operation, design features and specifications presented in technical bulletin 2041 which covers the Universal Burr-Master. Sketch showing edges chamfered on pinion in single operation, a close-up of machine head in operation and view of the complete machine are offered.

STEEL 4-14-52
Penton Building, Cleveland 13, Ohio

Please send literature or detailed information on subjects circled at left to—

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4	14	24	34	44	54	64	74	84
5	15	25	35	45	55	65	75	85
6	16	26	36	46	56	66	76	86
7	17	27	37	47	57	67	77	87
8	18	28	38	48	58	68	78	88
9	19	29	39	49	59	69	79	89
10	20	30	40	50	60	70	80	90

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80. Steel Stocks & Data

United States Steel Supply Div., United States Steel Co.—148-page "1952-53 Stock List and Reference Book" presents complete dimensional data on beams, channels, angles, plates, sheets, bars, strip, flats, drill rod, tool steel, high strength steels, reinforcing bars, tubing, expanding metal, boiler supplies, alloy steels and stainless sheets, plates, bars, tubing, pipe and metalworking machinery that are in stock. There is a different stock list for each of 14 warehouses in strategic industrial centers.

81. Turret Lathe

Simmons Machine Tool Corp.—A ram type turret lathe featuring microspeed drive with infinite range of reversible speeds and speed change by pushbutton control is subject of 4-page bulletin 1051. No. 2 lathe has 14-in. swing. You'll also get complete specifications, plus list of standard equipment and optional extras in this folder.

82. Direct Current Power Supply

Superior Electric Co.—In this 4-page illustrated bulletin V1051 you will find much pertinent data on the Varicell, a source of variable stabilized regulated direct current voltages that operates from alternating current lines. Circuit diagrams, outline dimensions, ratings and descriptive material are included.

83. Electric Motors

Wagner Electric Corp.—Dependable, versatile and troublefree are adjectives used to describe type RA general purpose electric motor in 4-page folder MU-94. Motor combines best features of two types of motors: the repulsion motor during starting period, and the induction motor while running. Variety of sizes cover 1/25 to 400 hp ranges.

84. Company Facilities

Emhart Mfg. Co.—"How Emhart Can Help" is 12-page brochure which shows how combined research, development and manufacturing abilities of company's five operating units can be of service to you in meeting new and old industrial problems.

85. Ferro-Alloys Developments

Vanadium Corp. of America—Informative articles appearing in 24-page "Vancoram Review" are "Analytical Methods for Determination of Vanadium in Low Alloy Content Steel" and "Recovery of Vanadium and Other Alloys in the Acid Electric Furnace." Aluminum, boron, chromium, silicon, special foundry, titanium and vanadium alloys are listed along with their typical composition and application.

86. Steel Shop Equipment

Standard Pressed Steel Co.—Seven bulletins, all illustrated and complete with model information and specifications, are devoted to line of steel shop equipment, including: work benches (701-7), cabinet benches (702-1), tool stands and tables (703-1), stools and chairs (704-1), foreman's desks (728), platform trucks (718-3), Uni-Truck hand trucks (789).

87. Fork Lift Trucks

Towmotor Corp.—Special series of broadsides are designed to explain specific features and capabilities of company's fork lift truck. Number 1 offers detailed engineering and illustrated data on truck's construction features, while No. 2 is examination of features such as clutch, transmission, universal joint, drive axle, steering, braking, etc. No. 3 takes truck apart from mechanics point of view.

EDITORIAL REPRINTS:

88. Easing Machine Shortage

STEEL reprint "Special Editions of Standard Machines Ease Shortage" tells how standard milling machines adapted for special production jobs offer the possibility of better delivery. These machines can be used for peace time products and their initial cost is relatively low.

89. Chromium Plating

How about your worn gages, bearing surfaces and cutting tools? Would you like to recondition them for new life? Then send for STEEL reprint entitled "Chromium Plating . . . New Life for Worn Parts" which presents some informative know-how on salvaging worn gages and tools through chromium plating.

90. Carbide Trepanning

"Carbide Trepanning . . . Accurate Bores in Record Time" is title of STEEL reprint which discusses this phenomenally quick process and how it removes most of the inside diameter as a solid core instead of chips. Author F. W. Lucht of G-E's Carboloy Dept. also tells how present boring machines can be converted for trepanning operations.

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1	11	21	31	41	51	61	71	81
2	12	22	32	42	52	62	72	82
3	13	23	33	43	53	63	73	83
4	14	24	34	44	54	64	74	84
5	15	25	35	45	55	65	75	85
6	16	26	36	46	56	66	76	86
7	17	27	37	47	57	67	77	87
8	18	28	38	48	58	68	78	88
9	19	29	39	49	59	69	79	89
10	20	30	40	50	60	70	80	90

STEEL
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4-14-52

Please send literature or detailed information on subjects circled at left to—

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COMPANY

PRODUCTS MANUFACTURED

ADDRESS

CITY AND STATE

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ous chemical method of applying a metallic copper coating to steel. No electric current or special equipment are necessary. The article is immersed in a chemical bath for 1 minute.

Cup Expanders

USE REPLY CARD—CIRCLE No. 22

Designated ES-11, a line of cup expanders is announced by HPL Mfg. Co., Cleveland 28, O., to eliminate leakage in hydraulic and pneumatic cylinders. They insure positive sealing action of cup packings at all times by exerting controlled pressure on packing lip so it maintains contact with cylinder wall.

Pneumatic Vise

USE REPLY CARD—CIRCLE No. 23

Model S-7 Airlox pneumatic vise is introduced by Production Devices Inc., Whitehall, N. Y. The air-operated wedge with levers, gives a grip on the work of 100 times air line pressure. It features chip plate and felt installation which reduces maintenance on vise.

Measures Bypass Flow

USE REPLY CARD—CIRCLE No. 24

The V/A cell, developed by Fischer & Porter Co., Hatboro, Pa., measures the static-pressure differential across the orifice and meters a continuous bypass stream around the orifice. Metering is kinetic. This method permits simple adjustment of the bypass rate to give unit flexibility.

Two Mercury Lamps

USE REPLY CARD—CIRCLE No. 25

General Electric's Lamp Division, Cleveland, O., introduces two mercury lamps. For general lighting service, they have reflectors built into the bulb. Ordinarily need no cleaning or other maintenance is necessary throughout their lives. Lamps are produced in 400-w size.

USE A REPLY CARD

Just circle the corresponding number of any item in this section for more information.

Vapor FROM Paper STOPS RUST

PACKAGING COSTS CUT FROM $4.95 TO $1.37

Back when messy oil and grease coatings were used to ward off corrosion of diesel locomotive parts, the maker had headaches at both ends of the line.

Packaging steps called for inflammable liquids, heavy handling equipment, air hoses, and varnish-like petroleum solutions. In those days, waxed paper and heavy wooden crates were "musts." At the railroad end, unpacking meant the same troubles in reverse; laborious "cleaning" was a costly chore.

Now, says the diesel firm, "packaging is a dream."

Large and small parts are protected only by a paper that gives off vapor. *It stops rust.* It is Angier VPI* Wrap.

A cylinder liner (see above) is simply put in a container with pieces of the paper. The lid on, VPI goes to work. Now cost of packaging is $1.37 — not $4.95. The liner is ready-to- use when received. No "cleaning" to do.

If you store or ship metal parts or products, get "VPI Facts" from Angier — the most experienced name in vapor rust preventives.

Angier VPI* WRAP

Angier

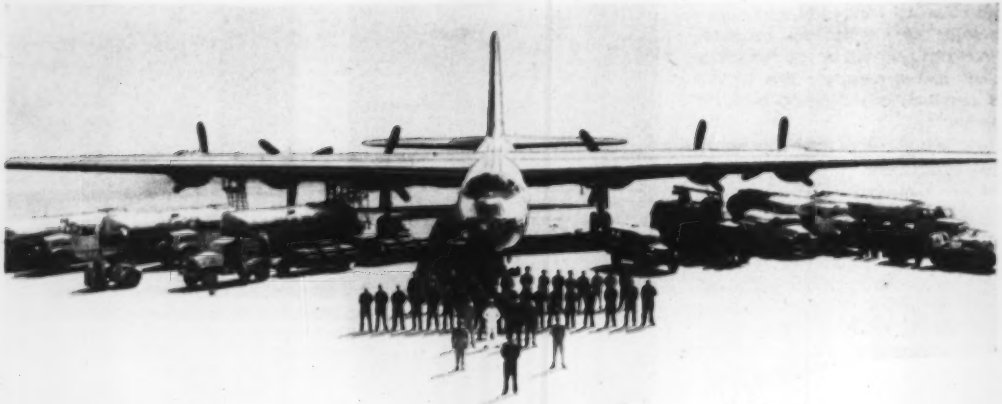
Distributors in All Principal Cities

Angier Corporation, Framingham 8, Mass.
Send "VPI Facts" as applied to:

☐ Machinery-Industrial, Metal Working, Farm, Office, Construction. ☐ Electrical Machinery, Appliances, Products.
☐ Transportation Equipment — Auto, Aircraft, Naval, Railroad etc. ☐ Fabricated Products — Cutlery, Hardware, etc.
☐ Steel in process of fabrication. ☐ Ordnance Equipment.
☐ Instruments and clocks. ☐ Other.

Sign below; attach to your letterhead

* R. Vapor Rust Preventive



COMPLETE INTEGRATION IS YOUR SAFEGUARD, TOO!

When you buy steel, you have the right to expect quality-as-specified. But consider . . . Only *complete integration* of every process—from ore mine to finished product—can assure high grade steel.

Alan Wood processes and plants form a *completely integrated* chain of production. Ore from Alan Wood Steel Company mines is tested in Alan Wood laboratories, smelted in Alan Wood blast furnaces, rolled in Alan Wood rolling mills. And Alan Wood quality control checks on every process—every step of the way!

PRODUCTS OF ALAN WOOD STEEL COMPANY

SPECIALTY PRODUCTS

STAINLESS CLAD STEEL
PERMACLAD stainless Clad Steel combines the surface characteristics of solid stainless with the easy forming qualities of mild carbon steel—provides corrosion resistance at lower cost.

ABRASIVE ROLLED STEEL FLOOR PLATE
A.W. ALGRIP Abrasive Rolled Steel Floor Plate is made by rolling tough abrasive grain as an integral part of the upper portion of steel plate. Result: Positive protection against slipping, even on steep inclines.

ROLLED STEEL FLOOR PLATE
A W SUPER-DIAMOND
Rolled Steel Floor Plate, made with an allover, engineered pattern of raised, skid-resistant diamonds, is easy to clean, easy to match, and grips without a slip.

IRON PRODUCTS
"Swede" Pig Iron
Foundry, Malleable, Bessemer and Basic

STEEL PRODUCTS
Plates (Sheared)
Tank, Ship, Boiler, Flange and Structural Qualities
Furnished in carbon, copper, or alloy analyses
A.W. Dynalloy
(High Strength Plates)

HOT ROLLED SHEETS
Special qualities in carbon, copper, or alloy analyses
A.W. Dynalloy
(High Strength Sheets)

HOT ROLLED STRIP
Coiled and cut lengths
Carbon, copper, or alloy analyses

A.W. ROLLED STEEL FLOOR PLATES
A.W. Algrip Abrasive
A.W. Super-Diamond Pattern

STAINLESS-CLAD STEEL
Permaclad Sheets and Plates
Standard and special qualities available in desired finishes

A.W. CUT NAILS
Reading Brand
Black, Quenched and Tempered

MINE PRODUCTS
Iron Ore Concentrates, Sintered Concentrates, Crushed Stone, Grit, Sand and Engine Sand

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Foundry, Industrial and Domestic

COAL CHEMICALS
Coke Oven Gas • Crude Coal Tar Ammonium Sulphate • Industrial Benzol, Toluol, Xylol • Motor Benzol • Crude Solvent Naphtha Crude Naphthalene • Crude Tar Bases • Sodium Phenolate • Crude Light Oil Still Residue

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CONSHOHOCKEN, PA.

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The Market Outlook

IF YOU hear somebody at the door, don't be surprised if it's a steel salesman.

Resumption of steel production after a brief interruption last week in connection with the labor-price dispute promised to keep steel flowing with hardly a noticeable break to consumers.

For weeks before the short stoppage in production the demand for steel was easing. Even the government controllers admitted that the supply and demand for steel likely would be in sufficient balance by the latter part of this year to permit lifting many of the controls from this material.

THE LOSS—The work interruption brought a loss of about three days' output. STEEL estimates the industry's production in the week ended Apr. 12 averaged 51 per cent of capacity.

The capacity continues to grow, thanks to the steel industry's expansion program. By the beginning of the second quarter the capacity had reached an annual level of 109,218,670 net tons, on the basis of a previously scheduled increase of 631,000 tons in the first quarter. Scheduled addition to capacity in the second quarter is 2,919,600 tons.

CAUTIOUS—Indicative of the reduced pressure for steel are steel consumers' attitudes toward inventories. Steel users, on the average, have three to four weeks' supply of steel. Legally, they're allowed 45-day stocks of most types of steel. Only one-third of the consumers have the limit on hand. The below-legal-limits inventories are more the result of voluntary action on the part of consumers than of unavailability of steel.

In the best position are medium and large companies whose primary needs are for sheet and strip. In the worst position are small companies that use plates or bars.

Consumers are not crowding in to place orders for third-quarter delivery of sheets and strip. Some producers still have openings in second-quarter schedules for cold-rolled strip. There is some spotty improvement in cold-rolled sheet buying, but producers of consumer durable goods are disturbed by buyer resistance to prices.

RESTRICTED—Heavy and wide plates continue to be one of the scarcest steel items, and to help improve the supply of them the government restricted the use of conventional plate mills to production of the heavy and wide material. After July 1, 1952, carbon steel plate ¾ inch or less in thickness cannot be produced on plate mills that are 160 inches or more wide. Light-gage and narrow plates are expected to be obtained to a great extent from continuous mills that have been diverted from hot strip production.

The defense program is helping keep steel bars in tight supply. Demand for shell steel is rising.

ROOM FOR DEVELOPMENT—Demand for structural shapes has picked up somewhat as a result of the easing in government restrictions on construction, but a lot of the shape business is still in the prospective stage. Wide-flange beams continue to be notably scarce.

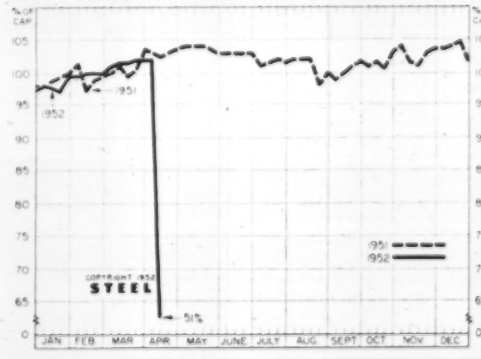
A government restrictive order helped prevent any run on warehouse steel stocks last week during the interruption in steel mill production. Warehouses should be in a relatively good position to continue building up and balancing their stocks.

EASE-UP—Reflecting the slowness of business in gray iron foundries and an improvement in the balance between supply and demand in pig iron, the government raised the limits on consumers' inventories of pig iron from 30 to 60 days' supply. This relaxation has not stirred up any noticeable increase in ordering.

The steel industry was continuing to make headway in improvement of its stocks of scrap. In one area, mills have a 30-day supply, the best in many months. Another mill quit buying bundles. Prices on steelmaking grades are still at ceilings. Foundries continue to shun cast grades of scrap, and price weakness in those grade continues.

Steel prices remain unchanged.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

Percentage of Capacity Engaged at Leading Production Points

	Week Ended Apr. 12†	Change	Same Week 1951	Same Week 1950
Pittsburgh	30	—73*	101.5	101.5
Chicago	40	—64	106	102
Mid-Atlantic	76	—23	100.5	91
Youngstown	40	—63	104	105
Wheeling	64	—36*	94.5	102.5
Cleveland	48.5	—52.5*	101.5	97
Buffalo	35	—69	104	104
Birmingham	50	—52	100	100
New England	97	—17	89	80
Cincinnati	60	—34	102	102
St. Louis	73.5	—13	92.5	84.5
Detroit	84.5	—21.5	103.5	106
Western	82	—20	107	96
Estimated national rate	51	—51	102.5	97.5

Based on weekly steelmaking capacity of 2,077,040 tons in 1952; 1,999,034 tons for 1951; 1,928,721 tons for second half, 1950; 1,906,268 tons for first half, 1950.

* Change from revised rate for preceding week. † Preliminary.

The Metalworking Outlook—p. 55 *Production-Engineering News*—p. 91

Composite Market Averages

FINISHED STEEL INDEX, Weighted:

	Apr. 19 1952	Week Ago	Month Ago	Year Ago	5 Yrs Ago
Index (1935-39 av. = 100)	171.92†	171.92†	171.92†	171.92	118.67
Index in cents per lb.	4.657†	4.657†	4.657†	4.657	3.215

ARITHMETICAL PRICE COMPOSITES:

Finished Steel, NT	$106.32†	$106.32†	$106.32†	$106.32	$69.82
No. 2 Fdry. Pig Iron, GT.	52.54	52.54	52.54	52.54	32.99
Basic Pig Iron, GT	52.16	52.16	52.16	52.16	32.49
Malleable Pig Iron, GT	53.27	53.27	53.27	53.27	33.71
Steelmaking Scrap, GT	43.00	43.00	43.00	44.00	34.92

Weighted finished steel index based on average shipments and Pittsburgh district prices of the following 14 representative products during 5-year base period 1935-39: Structural shapes, plates, rails, hot-rolled and cold-finished bars, pipe, wire, nails, tin plate, hot and cold-rolled sheets, galvanized sheets, hot and cold-rolled strip. For complete explanation see STEEL, Sept. 19, 1949, p. 54.

Arithmetical steel price composite based on same products as the weighted finished steel index with the exception of rails, cold-finished bars, galvanized sheets and hot-rolled strip.

Basic and No. 2 foundry pig iron composites are based on average prices at Pittsburgh, Bethlehem, Birmingham, Buffalo, Chicago, Cleveland, Granite City, Youngstown. Malleable composite based on same points except Birmingham.

Steelmaking scrap composite based on average prices of No. 1 heavy melting steel at Pittsburgh, Chicago and Philadelphia.

† Preliminary.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED MATERIALS

	Apr. 19 1952	Week Ago	Month Ago	Year Ago	5 Yrs Ago
Bars, H.R., Pittsburgh	3.70	3.70	3.70	3.70	2.60
Bars, H.R., Chicago	3.70	3.70	3.70	3.70	2.60
Bars, H.R., del. Philadelphia	4.223	4.223	4.223	4.20	2.98
Bars, C.F., Pittsburgh	4.55	4.55	4.55	4.55	3.20
Shapes, Std., Pittsburgh	3.65	3.65	3.65	3.65	2.50
Shapes, Std., Chicago	3.65	3.65	3.65	3.65	2.50
Shapes, del. Philadelphia	3.918	3.918	3.918	3.91	2.64
Plates, Pittsburgh	3.70	3.70	3.70	3.70	2.65
Plates, Chicago	3.70	3.70	3.70	3.70	2.65
Plates, Coatesville, Pa.	4.15	4.15	4.15	4.15	2.80
Plates, Sparrows Point, Md.	3.70	3.70	3.70	3.70	2.65
Plates, Claymont, Del.	4.15	4.15	4.15	4.15	2.80
Sheets, H.R., Pittsburgh	3.60-75	3.60-75	3.60-75	3.60-75	2.50
Sheets, H.R., Chicago	3.60	3.60	3.60	3.60	2.50
Sheets, C.R., Pittsburgh	4.35	4.35	4.35	4.35	3.20
Sheets, C.R., Chicago	4.35	4.35	4.35	4.35	3.20
Sheets, C.R., Detroit	4.55	4.55	4.55	4.55	3.35
Sheets, Galv., Pittsburgh	4.80	4.80	4.80	4.80	3.55
Strip, H.R., Pittsburgh	3.75-4.00	3.75-4.00	3.75-4.00	3.75-4.00	2.50
Strip, H.R., Chicago	3.50	3.50	3.50	3.50	2.50
Strip, C.R., Pittsburgh	4.65-5.35	4.65-5.35	4.65-5.35	4.65-5.35	3.20
Strip, C.R., Chicago	4.90	4.90	4.90	4.90	3.30
Strip, C.R., Detroit	4.85-5.60	4.85-5.60	4.85-5.60	4.35-5.60	3.35
Wire, Basic, Pittsburgh	4.85-5.10	4.85-5.10	4.85-5.10	4.85-5.10	3.425
Nails, Wire, Pittsburgh	5.90-6.20	5.90-6.20	5.90-6.20	5.90-6.20	4.125
Tin plate box, Pittsburgh	$8.70	$8.70	$8.70	$8.70	$5.75

SEMIFINISHED

Billets, forging, Pitts. (NT)	$66.00	$66.00	$66.00	$66.00	$50.00
Wire rods, ½"-⅝", Pitts.	4.10-30	4.10-30	4.10-30	4.10-30	2.675

PIG IRON, Gross Ton

Bessemer, Pitts.	$53.00	$53.00	$53.00	$53.00	$34.00
Basic, Valley	52.00	52.00	52.00	52.00	33.00
Basic, del. Phila.	56.61	56.61	56.61	56.49	35.52
No. 2 Fdry, Pitts.	52.50	52.50	52.50	52.50	33.50
No. 2 Fdry, Chicago	52.50	52.50	52.50	52.50	33.00
No. 2 Fdry, Valley	52.50	52.50	52.50	52.50	33.50
No. 2 Fdry, del. Phila.	57.11	57.11	57.11	56.99	36.02
No. 2 Fdry, Birm.	48.88	48.88	48.88	48.88	29.88
No. 2 Fdry (Birm.) del. Cin.	55.49	55.49	55.49	55.33	34.75
Malleable, Valley	52.50	52.50	52.50	52.50	33.50
Malleable, Chicago	52.50	52.50	52.50	52.50	33.50
Charcoal, Lyles, Tenn.	66.00	66.00	66.00	66.00	40.50
Ferromanganese, Etna, Pa.	188.00	188.00	188.00	188.00	140.25*

* F.o.b. cars, Pittsburgh.

SCRAP, Gross Ton (including broker's commission)

No. 1 Heavy Melt. Pitts.	$44.00	$44.00	$44.00	$45.00	$28.00
No. 1 Heavy Melt. E. Pa.	42.50	42.50	42.50	43.50	34.00
No. 1 Heavy Melt. Chicago	42.50	42.50	42.50	43.50	32.75
No. 1 Heavy Melt. Valley	44.00	44.00	44.00	45.00	35.25
No. 1 Heavy Melt. Cleve.	43.00	43.00	43.00	44.00	34.75
No. 1 Heavy Melt. Buffalo	43.00	43.00	43.00	44.00	36.00
Rails, Rerolling, Chicago	52.50	52.50	52.50	52.50	39.00
No. 1 Cast, Chicago	49.00*	49.00*	49.00*	49.00*	42.50

* F.o.b. shipping point.

COKE, Net Ton

Beehive, Furn. Connlsvl.	$14.75	$14.75	$14.75	$14.75	$8.75-9.50
Beehive, Fdry., Connlsvl.	17.50	17.50	17.50	17.50	9.75-11.00
Oven, Fdry., Chicago	23.00	23.00	23.00	21.00	15.10

NONFERROUS METALS

Copper, del. Conn.	24.50	24.50	24.50	24.50	21.50
Zinc, E. St. Louis	19.50	19.50	19.50	17.50	10.50
Lead, St. Louis	18.80	18.80	18.80	16.80	14.80-14.85
Tin, New York	121.50	121.50	121.50	147.00	80.00
Aluminum, del.	19.00	19.00	19.00	19.00	15.00
Antimony, Laredo, Tex.	50.00	50.00	50.00	42.00	33.00
Nickel, refinery, duty paid	36.50	36.50	36.50	36.50	35.00

PIG IRON

F.o.b. furnace prices quoted under GCPR as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal tax. Key to producing companies published on second following page.

PIG IRON, Gross Ton

	Basic	No. 2 Foundry	Malleable	Bessemer
Bethlehem, Pa. B2	$54.00	$54.50	$55.00	$55.50
Brooklyn, N.Y., del.	....	59.18	59.68	....
Newark, del.	56.87	57.37	57.87	58.37
Philadelphia, del.	56.61	57.11	57.61	58.11
Birmingham District				
Alabama City, Ala. R2	48.38	48.88	....	....
Birmingham R2	48.38	48.88	....	....
Birmingham S9	48.38	48.88	....	....
Woodward, Ala. W15	48.38	48.88	....	....
Cincinnati, del.	....	55.49	....	....
Buffalo District				
Buffalo R2	52.00	52.50	53.00	....
Buffalo H1	52.00	52.50	53.00	....
Tonawanda, N.Y. W12	52.00	52.50	53.00	....
No. Tonawanda, N.Y. T9	....	52.50	53.00	....
Boston, del.	62.11	62.61	63.11	....
Rochester, N.Y., del.	54.88	55.38	55.88	....
Syracuse, N.Y., del.	55.91	56.41	56.91	....
Chicago District				
Chicago I-3	52.00	52.50	52.50	53.00
Gary, Ind. U5	52.00	....	52.50	....
Indiana Harbor, Ind. I-2	52.00	....	52.50	....
So. Chicago, Ill. W14	52.00	52.50	52.50	....
So. Chicago, Ill. Y1	52.00	52.50	52.50	....
So. Chicago, Ill. U5	52.00	....	52.50	53.00
Milwaukee, del.	54.06	54.56	54.56	55.06
Muskegon, Mich., del.	....	58.47	58.47	....
Cleveland District				
Cleveland A7	52.00	52.50	52.50	53.00
Cleveland R2	52.00	52.50	52.50	....
Akron, O., del. from Cleve.	54.61	55.11	55.11	55.61
Lorain, O. N3	52.00	....	....	53.00
Duluth I-3	....	....	52.50	....
Erie, Pa. I-3	52.00	52.50	52.50	53.00
Everett, Mass. E1	....	59.75	60.25	....
Fontana, Calif. K1	58.00	58.50	....	....
Seattle, Tacoma, Wash., del.	....	60.66	....	....
Portland, Oreg., del.	....	60.66	....	....
Los Angeles, San Francisco, del.	60.16	60.66	....	....
Granite City, Ill. G4	53.90	54.40	54.90	....
St. Louis, del. (inc. tax)	54.66	55.16	55.66	....
Ironton, Utah C11	52.00	52.50	....	....
Geneva, Utah C11	52.00	52.50	....	....
Lone Star, Tex. L8	48.00	*48.50	48.50	....
Minnequa, Colo. C10	54.00	55.00	55.00	....
Pittsburgh District				
Neville Island, Pa. P6	....	52.50	52.50	53.00
Pitts., N.&S. sides, Ambridge, Aliquippa, del.	....	53.80	53.80	54.30
McKees Rocks, del.	....	53.54	53.54	54.04
Lawrenceville, Homestead, McKeesport, Monaca, del.	....	54.07	54.07	54.57
Verona, del.	....	54.57	54.57	55.07
Brackenridge, del.	....	54.82	54.82	55.32
Bessemer, Pa. U5	52.00	....	52.50	53.00
Clairton, Rankin, So. Duquesne, Pa. U5	52.00	....	....	....
McKeesport, Pa. N3	52.00	....	....	53.00
Monessen, Pa. P7	54.00	....	....	....
Sharpsville, Pa. S6	....	....	52.50	53.00
Steelton, Pa. B2	54.00	54.50	55.00	55.50
Swedeland, Pa. A3	56.00	56.50	57.00	57.50
Toledo, O. I-3	52.00	52.50	52.50	53.00
Cincinnati, del.	57.47	57.97	....	....
Troy, N.Y. R2	54.00	54.50	55.00	55.50
Youngstown District				
Hubbard, O. Y1	52.00	52.50	52.50	....
Youngstown Y1	52.00	52.50	52.50	....
Youngstown U5	52.00	....	....	53.00
Mansfield, O., del.	56.65	57.15	57.15	57.65

* Low phos, southern grade.

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si over base grade, 1.75-2.25%, except on low phos iron on which base is 1.75-2.00%.

Phosphorus: Deduct 38 cents per ton for P content of 0.70% and over.

Manganese: Add 50 cents per ton for each 0.50% manganese over 1% or portion thereof.

Nickel: Under 0.50% no extra; 0.50-0.74%, incl., add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.0-6.50% silicon; add $1.50 for each 0.5% Si)

Jackson, O. G2, J1	$62.50
Buffalo H1	63.75

ELECTRIC FURNACE SILVERY PIG IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1 for each 0.5% Mn over 1%; $1 for each 0.045% max. P)

Niagara Falls, N.Y. P15	$88.00
Keokuk, Iowa, Openhearth & Fdry., frt. allowed K2	92.50
Keokuk, OH & Fdry., 12% lb piglets, 16% Si, frt. allowed K2	95.50
Wenatchee, Wash., O.H. & Fdry., frt. allowed K2	92.50

CHARCOAL PIG IRON, Gross Ton

(Low phos semi-cold blast; differential charged for silicon over base grade; also for hard chilling iron Nos. 5 & 6)

Lyles, Tenn. T3	$66.00

LOW PHOSPHORUS PIG IRON, Gross Ton

Cleveland, intermediate, A7	$57.00
Steelton, Pa. B2	60.00
Philadelphia, delivered	63.37
Troy, N.Y. R2	60.00

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Semifinished and Finished Steel Products

Mill prices quoted under GCPR as reported to STEEL, Apr. 10, 1952; cents per pound except as otherwise noted. Changes shown in Italics. Code numbers following mill points indicate producing company; key on next two pages.

INGOTS, Carbon, Forging (NT)
Fontana,Calif. K1 ....$79.00
Munhall,Pa. U5 ....52.00

INGOTS, Alloy (NT)
Detroit R7 ....$54.00
Fontana,Calif. K1 ....80.00
Houston, S5 ....62.00
Midland,Pa. C18 ....54.00
Munhall,Pa. U5 ....54.00

BILLETS, BLOOMS & SLABS
Carbon, Rerolling (NT)
Bessemer,Pa. U5 ....$56.00
Clairton,Pa. U5 ....56.00
Ensley,Ala. T2 ....56.00
Fairfield,Ala. T2 ....56.00
Fontana,Calif. K1 ....75.00
Gary,Ind. U5 ....56.00
Johnstown,Pa. B2 ....56.00
Lackawanna,N.Y. B2 ....56.00
Munhall, Pa. U5 ....56.00
So.Chicago,Ill. U5 ....56.00
So.Duquesne,Pa. U5 ....56.00

Carbon, Forging (NT)
Bessemer,Pa. U5 ....$66.00
Buffalo R2 ....66.00
Canton,O. R2 ....66.00
Clairton,Pa. U5 ....66.00
Cleveland R2 ....66.00
Conshohocken,Pa. A3 ....73.00
Detroit R7 ....69.00
Ensley,Ala. T2 ....66.00
Fairfield,Ala. T2 ....66.00
Fontana,Calif. K1 ....85.00
Gary,Ind. U5 ....66.00
Geneva,Utah C11 ....66.00
Houston, S5 ....74.00
Johnstown,Pa. B2 ....66.00
Lackawanna,N.Y. B2 ....66.00
LosAngeles B3 ....85.00
Munhall,Pa. U5 ....66.00
Seattle B3 ....85.00
So.Chicago R2,U5,W14 ....66.00
So.Duquesne,Pa. U5 ....66.00
So.SanFrancisco B3 ....85.00

Alloy, Forging (NT)
Bethlehem,Pa. B2 ....$70.00
Buffalo R2 ....70.00
Canton,O. R2 ....70.00
Canton,O.(29) T7 ....66.00
Conshohocken,Pa. A3 ....77.00
Detroit R7 ....73.00
Fontana,Calif. K1 ....89.00
Gary,Ind. U5 ....70.00
Houston, S5 ....78.00
Ind.Harbor,Ind. Y1 ....70.00
Johnstown,Pa. B2 ....70.00
Lackawanna,N.Y. B2 ....70.00
Los Angeles B3 ....90.00
Massillon,O. R2 ....70.00
Midland,Pa. C18 ....70.00
Munhall,Pa. U5 ....70.00
So.Chicago R2,U5,W14 ....70.00
So.Duquesne,Pa. U5 ....70.00
Struthers,O. Y1 ....70.00
Warren,O. C17 ....70.00

ROUNDS, SEAMLESS TUBE (NT)
Canton,O. R2 ....$82.00
Cleveland R2 ....82.00
Fontana,Calif. K1 ....103.00
Gary,Ind. U5 ....82.00
Massillon,O. R2 ....82.00
So.Chicago,Ill. R2 ....82.00
So.Duquesne,Pa. U5 ....82.00

SHEET BARS (NT)
Fontana,Calif. K1 ....$89.00

SKELP
Aliquippa,Pa. J5 ....$3.45
Munhall,Pa. U5 ....3.35
Warren,O. R2 ....3.35
Youngstown R2, U5 ....3.35

WIRE RODS
Alton,Ill. L1 ....4.40
AlabamaCity,Ala. R2 ....4.10
Buffalo W12 ....4.10
Cleveland A7 ....4.10
Donora,Pa. A7 ....4.10
Fairfield,Ala. T2 ....4.10
Fontana,Calif. K1 ....4.90
Houston, S5 ....4.50
Johnstown,Pa. B2 ....4.10
Joliet,Ill. A7 ....4.10
LosAngeles B3 ....4.90
Minnequa,Colo. C10 ....4.35
Monessen,Pa. P7 ....4.30
No.Tonawanda,N.Y. B11 ....4.10
Pittsburg,Calif. C11 ....4.75
Portsmouth,O. P12 ....4.30
Roebling,N.J. R5 ....4.20
So.Chicago,Ill. R2 ....4.10
SparrowsPoint,Md. B2 ....4.20
Sterling,Ill.(1) N15 ....4.10
Struthers,O. Y1 ....4.10
Torrance,Calif. C11 ....4.90
Worcester,Mass. A7 ....4.40

SHEET STEEL PILING
Ind.Harbor,Ind. I-2 ....4.45
Lackawanna,N.Y. B2 ....4.45
Munhall,Pa. U5 ....4.45
So.Chicago,Ill. U5 ....4.45

STRUCTURALS
Carbon Steel Stand. Shapes
AlabamaCity,Ala. R2 ....3.60
Aliquippa,Pa. J5 ....3.65
Bessemer,Ala. T2 ....3.65
Bethlehem,Pa. B2 ....3.70
Clairton,Pa. U5 ....3.65
Fairfield,Ala. T2 ....3.65
Fontana,Calif. K1 ....4.25
Gary,Ind. U5 ....3.65
Geneva,Utah C11 ....3.65
Houston, S5 ....4.05
Ind.Harbor,Ind. I-2 ....3.65
Johnstown,Pa. B2 ....3.70
KansasCity,Mo. S5 ....4.25
Lackawanna,N.Y. B2 ....3.70
LosAngeles B3 ....4.25
Minnequa,Colo. C10 ....4.10
Munhall,Pa. U5 ....3.65
Niles,Calif.(22) P1 ....4.85
Phoenixville,Pa. P4 ....5.90
Portland,Oreg. O4 ....4.50
Seattle B3 ....4.30
So.Chicago,Ill. U5 W14 ....3.65
So.SanFrancisco B3 ....4.20
Torrance,Calif. C11 ....4.25
Weirton,W.Va. W6 ....3.90

Alloy Stand. Shapes
Clairton,Pa. U5 ....4.35
Fontana,Calif. K1 ....5.55
Munhall,Pa. U5 ....4.35
So.Chicago,Ill. U5 ....4.35

H.S., L.A. Stand. Shapes
Aliquippa,Pa. J5 ....5.50
Bessemer,Ala. T2 ....5.50
Bethlehem,Pa.(14) B2 ....5.50
Clairton,Pa. U5 ....5.50
Fairfield,Ala. T2 ....5.50
Fontana,Calif. K1 ....6.10
Gary,Ind. U5 ....5.50
Geneva,Utah C11 ....5.50
Ind.Harbor,Ind. I-2 ....5.50
Ind.Harbor,Ind. Y-1 ....6.00
Johnstown,Pa. B2 ....5.50
Lackawanna,N.Y.(14) B2 ....5.50
LosAngeles B3 ....6.05
Munhall,Pa. U5 ....5.50
Seattle B3 ....6.10
So.Chicago,Ill. U5 ....5.50
So.SanFrancisco B3 ....6.00
Struthers,O. Y1 ....6.00

Wide Flange
Bethlehem,Pa. B2 ....3.70
Clairton,Pa. U5 ....3.65
Fontana,Calif. K1 ....4.65
Lackawanna,N.Y. B2 ....3.70
Munhall,Pa. U5 ....3.65
So.Chicago,Ill. U5 ....3.65

H.S., L.A. Wide Flange
Aliquippa,Pa. J5 ....5.50
Lackawanna,N.Y. B2 ....5.50
Munhall,Pa. U5 ....5.45
So.Chicago,Ill. U5 ....5.45

BEARING PILES
Munhall,Pa. U5 ....3.65
So.Chicago,Ill. U5 ....3.65

PLATES,High-Strength Low-Alloy
Aliquippa,Pa. J5 ....5.90
Bessemer,Ala. T2 ....5.85
Clairton,Pa. U5 ....5.65
Cleveland J5, R2 ....5.65
Conshohocken,Pa. A3 ....5.90
Fairfield,Ala. T2 ....5.65
Fontana,Calif.(30) K1 ....6.25
Gary,Ind. U5 ....5.65
Geneva,Utah C11 ....5.65
Ind.Harbor,Ind. I-2 ....5.65
Ind.Harbor,Ind. Y-1 ....6.15
Johnstown,Pa. B2 ....5.65
Munhall,Pa. U5 ....5.65
Pittsburgh J5 ....5.65
Seattle B3 ....6.55
Sharon,Pa. S3 ....5.70
So.Chicago,Ill. U5 ....5.65
SparrowsPoint,Md. B2 ....5.65
Warren,O. R2 ....5.65
Youngstown Y1 ....6.15

PLATES, Open-Hearth Alloy
Claymont,Del. C22 ....4.85
Coatesville,Pa. L7 ....5.25
Conshohocken,Pa. A3 ....5.05
Fontana,Calif. K1 ....5.70
Gary,Ind. U5 ....4.75
Johnstown,Pa. B2 ....4.75
Munhall,Pa. U5 ....4.75
Sharon,Pa. S3 ....5.20
So.Chicago,Ill. U5 ....4.75
SparrowsPoint,Md. B2 ....4.75

FLOOR PLATES
Cleveland J5 ....4.75
Conshohocken,Pa. A3 ....4.75
Ind.Harbor,Ind. I-2 ....4.75
Munhall,Pa. U5 ....4.75
So.Chicago,Ill. U5 ....4.75

PLATES, Ingot Iron
Ashland,c.l. (15) A10 ....3.95
Ashland,l.c.l (15) A10 ....4.45
Cleveland,c.l. R2 ....4.30
Warren,O.c.l. R2 ....4.30

PLATES, Carbon Steel
AlabamaCity,Ala. R2 ....3.70
Aliquippa,Pa. J5 ....3.70
Ashland,Ky. (15) A10 ....3.70
Bessemer,Ala. T2 ....3.70
Clairton,Pa. U5 ....3.70
Claymont,Del. C22 ....4.15
Cleveland J5, R2 ....3.70
Coatesville,Pa. L7 ....4.15
Conshohocken,Pa. A3 ....4.15
Fairfield,Ala. T2 ....3.70
Fontana,Calif. (30) K1 ....4.30
Gary,Ind. U5 ....3.70
GraniteCity,Ill. G4 ....4.40
Geneva,Utah C11 ....3.70
Harrisburg,Pa. C5 ....6.30
Houston, S5 ....4.10
Ind.Harbor,Ind. I-2, Y1 ....3.70
Johnstown,Pa. B2 ....3.70
Lackawanna,N.Y. B2 ....3.70
Minnequa,Colo. C10 ....4.50
Munhall,Pa. U5 ....3.70
Pittsburgh J5 ....3.70
Seattle B3 ....4.60
Sharon,Pa. S3 ....3.95
So.Chicago,Ill. U5 W14 ....3.70
SparrowsPoint,Md. B2 ....3.70
Steubenville,O. W10 ....3.70
Warren,O. R2 ....3.70
Weirton,W.Va. W6 ....4.00
Youngstown R2, U5, Y1 ....3.70

PLATES, Carbon A.R.
Fontana,Calif. K1 ....5.45
Geneva,Utah C11 ....4.85

PLATES, Wrought Iron
Economy,Pa. B14 ....8.60

BARS, Hot-Rolled Carbon
AlabamaCity,Ala. R2 ....3.70
Aliquippa,Pa. J5 ....3.70
Alton,Ill. L1 ....4.15
Atlanta,Ga. A11 ....4.25
Bessemer,Ala. T2 ....3.70
Buffalo R2 ....3.70
Canton,O. R2 ....3.70
Clairton,Pa. U5 ....3.70
Cleveland R2 ....3.70
Detroit R7 ....3.85
Emeryville,Calif. J7 ....4.45
Fairfield,Ala. T2 ....3.70
Fontana,Calif. K1 ....4.40
Gary,Ind. U5 ....3.70
Houston, S5 ....4.10
Ind.Harbor,Ind. I-2 Y1 ....3.70
Johnstown,Pa. B2 ....3.70
KansasCity,Mo. S5 ....4.30
Lackawanna,N.Y. B2 ....3.70
LosAngeles B3 ....4.40
Milton,Pa. B6 ....4.55
Minnequa,Colo. C10 ....4.15
Niles,Calif. P1 ....5.05
N.Tonawanda,N.Y. B11 ....3.70
Pittsburg,Calif. C11 ....4.40
Pittsburgh J5 ....3.70
Portland,Oreg. O4 ....4.65
Seattle B3, N14 ....4.45
Struthers,O. Y1 ....3.70
Torrance,Calif. C11 ....4.40
Weirton,W.Va. W6 ....3.85
So.Chicago R2, U5, W14 ....3.70
So.Duquesne,Pa. U5 ....3.70
So.SanFran.,Cal. B3 ....4.45
Youngstown R2, U5 ....3.70

BAR SIZE ANGLES; S. Shapes
Aliquippa,Pa. J5 ....3.70
Atlanta A11 ....4.25
Johnstown,Pa. B2 ....3.70
Kansas,N.Y. B2 ....3.70
Niles,Calif. P1 ....5.05
Portland,Oreg. O4 ....4.65
Youngstown R2, U5 ....3.70

BAR SIZE ANGLES; H.R. CARBON
Bethlehem,Pa. B2 ....3.90

BARS, Hot-Rolled Alloy
Bethlehem,Pa. B2 ....4.30
Buffalo R2 ....4.30
Canton,O. R2 ....4.30
Canton,O.(29) T7 ....3.95
Clairton,Pa. U5 ....4.30
Detroit R7 ....4.45
Ecorse,Mich. G5 ....4.65
Fontana,Calif. K1 ....5.35
Gary,Ind. U5 ....4.30
Houston, S5 ....4.70
Ind.Harbor,Ind. I-2 Y1 ....4.30
Johnstown,Pa. B2 ....4.30
KansasCity,Mo. S5 ....4.90
Lackawanna,N.Y. B2 ....4.30
LosAngeles B3 ....5.35
Massillon,O. R2 ....4.30
Midland,Pa. C18 ....4.30
So.Chicago R2, U5, W14 ....4.30
So.Duquesne,Pa. U5 ....4.30
Struthers,O. Y1 ....4.30
Warren,O. C17 ....4.30
Youngstown U5 ....4.30

BAR SHAPES, Hot-Rolled Alloy
Clairton,Pa. U5 ....4.55
Gary,Ind. U5 ....4.55
Youngstown U5 ....4.55

BARS & SMALL SHAPES, H.R., High-Strength Low-Alloy
Aliquippa,Pa. J5 ....5.55
Bessemer,Ala. T2 ....5.55
Bethlehem,Pa. B2 ....5.55
Clairton,Pa. U5 ....5.55
Cleveland R2 ....5.55
Fairfield,Ala. T2 ....5.55
Fontana,Calif. K1 ....6.60
Gary,Ind. U5 ....5.55
Ind.Harbor,Ind. I-2 ....5.55
Indiana Harbor,Ind. I-2 ....5.55
Johnstown,Pa. B2 ....5.55
Lackawanna,N.Y. B2 ....5.55
LosAngeles B3 ....6.25
Pittsburgh J5 ....5.55
Seattle B3 ....6.30
So.Duquesne,Pa. U5 ....5.55
So.SanFrancisco B3 ....6.30
Struthers,O. Y1 ....6.05
Youngstown U5 ....5.55

BARS, Cold-Finished Carbon
Ambridge,Pa. W18 ....4.55
BeaverFalls,Pa. M12,R2 ....4.55
Buffalo, B5 ....4.60
Camden,N.J. P13 ....5.05
Carnegie,Pa. C12 ....4.55
Chicago W18 ....4.55
Cleveland A7, C20 ....4.55
Detroit P17 ....4.70
Donora,Pa. A7 ....4.55
Elyria,O. W8 ....4.55
FranklinPark,Ill. N5 ....4.55
Gary,Ind. R2 ....4.55
GreenBay,Wis. P7 ....4.55
Hammond,Ind. L2, M13 ....4.55
Hartford,Conn. R2 ....5.10
Harvey,Ill. B5 ....4.55
LosAngeles R2 ....6.00
Mansfield,Mass. B5 ....5.10
Massillon,O. R2, R8 ....4.55
Monaca,Pa. S17 ....4.55
Newark,N.J. W18 ....5.00
Plymouth,Mich. P5 ....4.80
Pittsburgh J5 ....4.55
Putnam,Conn. W18 ....5.10
Readville,Mass. C14 ....5.10
St.Louis,Mo. M5 ....4.95
So.Chicago,Ill. W14 ....4.55
SpringCity,Pa. (5) K3 ....5.00
Struthers,O. Y1 ....4.55
Waukegan,Ill. A7 ....4.55
Youngstown F3, Y1 ....4.55

BARS, Cold-Finished Alloy
Ambridge,Pa. W18 ....5.40
BeaverFalls,Pa. M12 ....5.40
Bethlehem,Pa. B2 ....5.40
Buffalo B5 ....5.40
Camden,N.J. P13 ....5.80
Canton,O. R2 ....5.40
Canton,O.(29) T7 ....4.90
Carnegie,Pa. C12 ....5.40
Chicago W18 ....5.40
Cleveland A7 ....5.45
Cleveland C20 ....5.40
Detroit P17 ....5.55
Donora,Pa. A7 ....5.45
Elyria,O. W8 ....5.40
Gary,Ind. R2 ....5.40
Hammond,Ind. L2, M13 ....5.40
Hartford,Conn. R2 ....5.85
Harvey,Ill. B5 ....5.40
Lackawanna,N.Y. B2 ....5.40
Mansfield,Mass. B5 ....5.85
Massillon,O. R2, R8 ....5.40
Midland,Pa. C18 ....5.40
Monaca,Pa. S17 ....5.40
Newark,N.J. W18 ....5.75
Plymouth,Mich. P5 ....5.60
So.Chicago,Ill. R2, W14 ....5.40
Struthers,O. Y1 ....5.40
Warren,O. C17 ....5.40
Waukegan,Ill. A7 ....5.45
Worcester,Mass. A7 ....5.75
Youngstown F3, Y1 ....5.40

RAIL STEEL BARS
ChicagoHts.(3,4) C2 ....4.75
ChicagoHts.(3,4) I-2 ....4.75
Franklin,Pa. (3,4) F5 ....4.75
FortWorth,Tex.(26) T4 ....4.85
Huntngtn,W.Va.(3) W7 ....5.50
Marion,O.(3) M14 ....4.75
Moline,Ill.(3) R2 ....3.80
Tonawanda(3,4) B12 ....4.75
Williamsport(3) S19 ....5.00
Williamsport,(4) S19 ....5.10

BARS, Wrought Iron
Dover,N.J.(Staybolt)U1 ....15.00
Dover,(Eng.Bolt) U1 ....13.50
Dover,(Wrgh.Iron) U1 ....12.25
Economy,Pa.(S.R.) B14 ....9.60
Economy,Pa.(D.R.)B14 ....11.90
Economy,(Staybolt)B14 ....12.20
McK.Rks.(Staybolt)L5 ....14.50
McK.Rks.(S.R.) L5 ....9.60
McK.Rks.(D.R.) L5 ....13.00

BARS, Reinforcing (Fabricators)
AlabamaCity,Ala. R2 ....3.70
Atlanta A11 ....4.25
Buffalo R2 ....3.70
Cleveland R2 ....3.70
Emeryville,Calif. J7 ....4.45
Fairfield,Ala. T2 ....3.70
Fontana,Calif. K1 ....4.40
Gary,Ind. U5 ....3.70
Geneva,Utah C11 ....3.70
Houston, S5 ....4.10
Ind.Harbor,Ind. I-2, Y1 ....3.70
Johnstown,Pa. B2 ....3.70
KansasCity,Mo. S5 ....4.30
Lackawanna,N.Y. B2 ....3.70
LosAngeles B3 ....4.40
Milton,Pa. B6 ....4.55
Minnequa,Colo. C10 ....4.50
Niles,Calif. P1 ....5.05
Pittsburg,Calif. C11 ....4.40
Pittsburgh J5 ....3.70
Portland,Oreg. O4 ....4.65
Seattle B3, N14 ....4.55
So.Chicago,Ill. R2 ....3.70
So.SanFrancisco B3 ....4.45
SparrowsPoint,Md. B2 ....3.70
Struthers,O. Y1 ....3.70
Torrance,Calif. C11 ....4.40
Youngstown R2, U5 ....3.70

BARS, Reinforcing
(Fabricated; to Consumers)
Huntington,W.Va. W7 ....5.00
Johnstown,¼-1" B2 ....4.75
LosAngeles B3 ....5.45
Marion,O. P11 ....5.00
Seattle B3, N14 ....5.55
So.SanFrancisco B3 ....5.45
SparrowsPt. ¼-1" B2 ....4.75
Williamsport,Pa. S19 ....5.10

SHEETS, Hot-Rolled Steel
(18 gage and heavier)
AlabamaCity,Ala. R2 ....3.60
Ashland,Ky.(15) A10 ....3.60
Butler,Pa. A10 ....3.60
Cleveland J5, R2 ....3.60
Conshohocken,Pa. A3 ....4.00
Detroit, M1 ....4.40
Ecorse,Mich. (8) G5 ....3.80
Fairfield,Ala. T2 ....3.60
Fontana,Calif. K1 ....4.55
Gary,Ind. U5 ....3.60
Geneva,Utah C11 ....3.70
GraniteCity,Ill. G4 ....4.30
Ind.Harbor,Ind. I-2, Y1 ....3.60
Irvin,Pa. U5 ....3.60
Lackawanna,N.Y. B2 ....3.60
Munhall,Pa. U5 ....3.60
Niles,O. N12 ....3.25
Pittsburg,Calif. C11 ....4.30
Pittsburgh J5 ....3.60
Sharon,Pa. S3 ....4.00
So.Chicago,Ill. W14 ....3.60
SparrowsPoint,Md. B2 ....3.60
Steubenville,O. W10 ....3.60
Torrance,Calif. C11 ....4.30
Warren,O. R2 ....3.60
Weirton,W.Va. W6 ....3.60
WestLeechburg,Pa. A4 ....3.75
Youngstown U5, Y1 ....3.60

SHEETS, H.R. (19 gage)
AlabamaCity,Ala. R2 ....4.75
Dover,O. R1 ....5.65
Ind.Harbor,Ind. I-2 ....5.40
Mansfield,O. E6 ....5.65
Niles,O. N12 ....5.75
Torrance,Calif. C11 ....5.40

SHEETS, H.R. (14 ga., heavier)
High-Strength Low-Alloy
Cleveland J5, R2 ....5.40
Conshohocken,Pa. A3 ....5.65
Ecorse,Mich. G5 ....5.95
Fairfield,Ala. T2 ....5.40
Fontana,Calif. K1 ....6.35
Gary,Ind. U5 ....5.40
Ind.Harbor,Ind. I-2 ....5.40
Ind.Harbor,Ind. Y1 ....5.90
Irvin,Pa. U5 ....5.40
Lackawanna(35) B2 ....5.40
Pittsburgh J5 ....5.40
Sharon,Pa. S3 ....5.40
So.Chicago,Ill. U5 ....5.40
SparrowsPoint(36) B2 ....5.40
Warren,O. R2 ....5.40
Weirton,W.Va. W6 ....5.75
Youngstown U5 ....5.40
Youngstown Y1 ....5.90

SHEETS, Cold-Rolled
High-Strength Low-Alloy
Cleveland J5, R2 ....6.65
Ecorse,Mich. G5 ....7.10
Fontana,Calif. K1 ....7.50
Gary,Ind. U5 ....6.55
IndianaHarbor,Ind. Y1 ....7.05
IndianaHarbor,Ind. I-2 ....6.55
Irvin,Pa. U5 ....6.55
Lackawanna(37) B2 ....6.55
Pittsburgh J5 ....6.55
SparrowsPoint(38) B2 ....6.55
Warren,O. R2 ....6.55
Weirton,W.Va. W6 ....6.90
Youngstown Y1 ....7.05

SHEETS, Cold-Rolled Steel (Commercial Quality)

Butler,Pa. A10	4.35
Cleveland, J5, R2	4.35
Ecorse,Mich. G5	4.55
Fairfield,Ala. T2	4.35
Follansbee,W.Va. F4	4.55
Fontana,Calif. K1	5.30
Gary,Ind. U5	4.35
Granite City,Ill. G4	5.05
Ind.Harbor,Ind. I-2, Y1	4.35
Irvin,Pa. U5	4.35
Lackawanna,N.Y. B2	4.35
Middletown,O. A10	4.35
Pittsburg,Calif. C11	5.30
Pittsburgh, J5	4.35
SparrowsPoint,Md. B2	4.35
Steubenville,O. W10	4.35
Warren,O. R2	4.35
Weirton,W.Va. W6	4.35
Youngstown, Y1	4.35

SHEETS, Gal'd No. 10 Steel

Alabama City,Ala. R2	4.80
Ashland,Ky.(8) A10	4.80
Canton,O. R2	4.80
Dover,O. R1	5.50
Fairfield,Ala. T2	4.80
Gary,Ind. U5	4.80
Granite City,Ill. G4	5.50
Ind.Harbor,Ind. I-2	4.80
Irvin,Pa. U5	4.80
Kokomo,Ind.(13) C16	5.20
Martins Ferry,O. W10	4.80
Niles,O. N12	6.00
Pittsburg,Calif. C11	5.30
SparrowsPoint,Md. B2	4.80
Steubenville,O. W10	4.80
Torrance,Calif. C11	5.50
Weirton,W.Va. W6	4.80

SHEETS, Galvanized No. 10, High-Strength Low-Alloy

Irvin,Pa. U5	7.20
SparrowsPoint,Md. B2	6.60

SHEETS, Galvannealed Steel

Canton,O. R2	5.25
Irvin,Pa. U5	5.35
Kokomo,Ind.(13) C16	5.75
Niles,O. N12	8.50

SHEETS, ZINCGRIP Steel No. 10

Butler,Pa. A10	5.05
Middletown,O. A10	5.05

SHEETS, Electro Galvanized

Cleveland,R2 (28)	5.65
Niles,O. R2 (28)	5.65
Weirton,W.Va. W6	5.50

SHEETS, Zinc Alloy

Ind.Harbor,Ind. I-2	5.50

SHEETS, Drum Body

Pittsburg,Calif. C11	4.30
Torrance,Calif. C11	4.30

SHEETS, Wall Casing

Fontana,Calif. K1	5.10

BLUED Stock, 29 ga.

Yorkville,O. W10	6.80
Follansbee,W.Va.(2) F4	6.85

TIN PLATE, Electrolytic (Base Box)

	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$7.15	$7.40	$7.80
Fairfield,Ala. T2	7.25	7.50	7.90
Gary,Ind. U5	7.15	7.40	7.80
Granite City,Ill. G4	7.35	7.60	8.00
Ind.Harbor,Ind. I-2, Y1	7.15	7.40	7.80
Irvin,Pa. U5	7.15	7.40	7.80
Niles,O. R2	7.15	7.40	7.80
Pittsburg,Calif. C11	7.95	8.15	8.55
SparrowsPoint,Md. B2	7.25	7.50	7.90
Weirton,W.Va. W6	7.15	7.40	7.80
Yorkville,O. W10	7.15	7.40	7.80

SHEETS, SILICON, H.R. or C.R. (22 Ga.) COILS (Cut Lengths 1/16 lower)

	Field	Armature	Electric	Motor	Dynamo
Beech Bottom,W.Va. (cut lengths)			7.25	8.50	9.30
Brackenridge,Pa. A4			7.75	9.00	9.80
Granite City,Ill. G4 (cut lengths)			7.95	9.20	....
Ind.Harbor,Ind. I-2	6.95	7.25	(34)	....	....
Mansfield,O. E6 (cut lengths)	7.10	7.25	7.75	9.00	9.80
Niles,O. N12 (cut lengths)		6.75	7.25	....	....
Vandergrift,Pa. U5		7.25	7.75	9.00	9.80
Warren,O. R2	6.95	7.25	7.75	9.00	9.80
Zanesville,O. A10		7.25	7.75	9.00	9.80

SHEETS, SILICON (22 Ga. Base) Coils (Cut Lengths 1/16 lower)

Transformer Grade	72	65	58	52
Beech Bottom,W.Va. (cut lengths)	9.85	10.40	11.10	11.90
Brackenridge,Pa. A4	10.35	....	....	....
Vandergrift,Pa. U5	10.35	10.90	11.60	12.40
Warren,O. R2	10.35	....	....	....
Zanesville,O. A10	10.35	10.90	11.60	12.40

H.R. or C.R. COILS AND CUT LENGTHS, SILICON (22 Ga.)

	T-100	T-90	T-80	T-73
Butler,Pa. A10 (C.R.)	....	....	14.75	15.25
Vandergrift,Pa. U5	12.90	13.75	14.75	15.25

SHEETS, Enameling Iron

Ashland,Ky.(8) A10	4.65
Cleveland R2	4.65
Gary,Ind. U5	4.65
Granite City,Ill. G4	5.30
Ind.Harbor,Ind. I-2	4.65
Irvin,Pa. U5	4.65
Middletown,O. A10	4.65
Youngstown Y1	4.65

BLACK PLATE (Base Box)

Aliquippa,Pa. J5	$6.25
Fairfield,Ala. T2	6.35
Gary,Ind. U5	6.25
Granite City,Ill. G4	6.45
Ind.Harbor,Ind. I-2, Y1	6.25
Irvin,Pa. U5	6.25
Niles,O. R2	6.25
Pittsburg,Calif. C11	7.00
SparrowsPoint,Md. B2	6.35
Warren,O. R2	6.25
Weirton,W.Va. W6	6.25
Yorkville,O. W10	6.25

HOLLOWARE ENAMELING Black Plate (29 gage)

Beech Bottom,W.Va. (3)	5.85
Gary,Ind. U5	5.85
Granite City,Ill. G4	6.05
Ind.Harbor,Ind. Y1	5.30
Irvin,Pa. U5	5.85
Yorkville,O. W10	6.15

SHEETS, Culvert No. 16

	Cu	Cu
	No. 16	Alloy
Ashland,Ky. A10	5.60	....
Canton,O. R2	5.65	6.10
Fairfield,Ala. T2	5.60	5.85
Gary,Ind. U5	5.60	5.85
Indiana Harbor,Ind. I-2	5.60	5.85
Irvin,Pa. U5	5.60	5.85
Kokomo,Ind. C16	6.25	....
Martins Ferry,O. W10	5.60	5.85
Pittsburg,Cal. C11	6.35	....
SparrowsPt.,Md. B2	5.60	....
Torrance,Cal. C11	6.35	....

SHEETS, Culvert, No. 16 Pure Iron

Ashland,Ky. A10	5.85
Fairfield,Ala. T2	5.85

SHEETS, Hot-Rolled Ingot Iron 18 Gage and Heavier

Ashland,Ky.(8) A10	3.85
Cleveland R2	4.20
Ind.Harbor,Ind. I-2	3.85
Warren,O. R2	4.20

SHEETS, Cold-Rolled Ingot Iron

Cleveland R2	4.95
Middletown,O. A10	4.85
Warren,O. R2	4.95

SHEETS, Galvanized Ingot Iron No. 10 flat

Ashland,Ky.(8) A10	5.05
Canton,O. R2	5.55

SHEETS, ZINCGRIP Ingot Iron

Butler,Pa. A10	5.30
Middletown,O. A10	5.30

SHEETS, ALUMINIZED

Butler,Pa. A10	8.15

TINPLATE, American 1.25 Coke (Base Box)

	lb	1.50 lb
Aliquippa,Pa. J5	$8.45	$8.70
Fairfield,Ala. T2	8.55	8.80
Gary,Ind. U5	8.45	8.70
Ind.Har. I-2, Y1	8.45	8.70
Irvin,Pa. U5	8.45	8.70
Pitts.,Cal. C11	9.20	9.45
Sp.Pt.,Md. B2	8.55	8.80
Warren,O. R2	8.45	8.70
Weirton,W.Va. W6	8.45	8.70
Yorkville,O. W10	8.45	8.70

MANUFACTURING TERNES (Special Coated)

Fairfield,Ala. T2	$7.60
Gary,Ind. U5	7.50
Irvin,Pa. U5	7.50
SparrowsPoint,Md. B2	7.60
Yorkville,O. W10	7.50

SHEETS, LT. Coated Ternes, 6 lb

Yorkville,O. W10	$8.40

SHEET, Mfg. Ternes, 8 lb (Commercial Quality)

Gary,Ind. U5	$9.50
Yorkville,O. W10	9.50

SHEET, Long Terne Steel (Commercial Quality)

Beech Bottom,W.Va. W10	5.20
Gary,Ind. U5	5.20
Mansfield,O. E6	6.05
Middletown,O. A10	5.20
Niles,O. N12	6.00
Weirton,W.Va. W6	5.20

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10	5.60

ROOFING SHORT TERNES (8 lb Coated)

Gary,Ind. U5	9.50

STRIP, Hot-Rolled High-Strength Low-Alloy

Bessemer,Ala. T2	5.30
Conshohocken,Pa. A3	5.55
Ecorse,Mich. G5	5.95
Fairfield,Ala. T2	5.30
Fontana,Calif. K1	6.20
Gary,Ind. U5	5.30
Ind.Harb.,Ind. I-2	5.30
Indiana Harbor,Ind. Y1	5.30
Lackawanna,N.Y. B2	4.95
Los Angeles (25) B3	6.60
Seattle B3	6.30
Sharon,Pa. S3	5.40
So.San Francisco(25) B3	6.05
SparrowsPoint,Md. B2	4.95
Warren,O. R2	5.30
Weirton,W.Va. W6	5.75
Youngstown Y1	5.80
Youngstown U5	5.30

STRIP, Cold-Rolled High-Strength Low-Alloy

Cleveland J5	6.70
Cleveland A7	6.55
Dover,O. G6	7.30
Fontana,Calif. K1	6.95
Lackawanna,N.Y. B2	6.40
Sharon,Pa. S3	6.55
SparrowsPoint,Md. B2	6.40
Warren,O. R2	6.55
Weirton,W.Va. W6	7.20
Youngstown Y1	7.05

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2	3.50
Alton,Ill. L1	3.95
Ashland,Ky.(8) A10	3.50
Atlanta A11	4.05
Bessemer,Ala. T2	3.50
Bridgeport,Conn.(10) S15	4.00
Buffalo(27) R2	3.50
Butler,Pa. A10	3.50
Carnegie,Pa. S18	4.00
Conshohocken,Pa. A3	3.90
Detroit M1	4.40
Ecorse,Mich. G5	3.80
Fairfield,Ala. T2	3.50
Fontana,Calif. K1	4.75
Gary,Ind. U5	3.50
Houston,Tex. S5	4.90
Ind.Harbor,Ind. I-2, Y1	3.50
Johnstown,Pa.(25) B2	3.50
Kansas City,Mo.(9) S5	4.10
Lackawanna,N.Y.(32) B2	3.50
Los Angeles B3	4.25
Milton,Pa. B6	4.35
Minnequa,Colo. C10	4.55
New Britain(10) S15	4.00
No.Tonawanda,N.Y. B11	3.50
Pittsburg,Calif. C11	4.25
Riverdale,Ill. A1	3.50
San Francisco S7	4.85
Seattle B3, N14	4.50
Sharon,Pa. S3	4.00
So.Chicago,Ill. W14	3.50
So.San Francisco B3	4.25
SparrowsPoint,Md. B2	3.50
Torrance,Calif. C11	4.25
Warren,O. R2	3.50
Weirton,W.Va. W6	3.60
West Leechburg,Pa. A4	3.75
Youngstown U5, Y1	3.50

STRIP, Hot-Rolled Alloy

Bridgeport,Conn.(10) S15	5.45
Carnegie,Pa. S18	5.85
Fontana,Calif. K1	6.70
Gary,Ind. U5	5.50
Houston,Tex. S5	5.90
Kansas City,Mo. S5	6.10

STRIP, Cold-Finished Spring Steel (Annealed)

	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Berea,O. C7	....	6.80	7.40	9.35	11.65
Bridgeport,Conn.(10) S15	5.35	6.80	7.40	9.35	11.65
Bristol,Conn. W1	....	....	7.70	9.65	....
Carnegie,Pa. S18	....	6.80	7.40	9.35	11.65
Cleveland A7	4.65	6.45	7.40	9.35	11.65
Dearborn,Mich. D3	5.60	7.05	7.65	....	....
Detroit D2	5.60	6.65	7.25	....	....
Dover,O. G6	5.50	6.80	7.40	9.35	11.65
Franklin Park,Ill. T6	5.00	6.60	7.55	9.50	11.80
Harrison,N.J. C18	....	....	7.70	9.65	11.95
Mattapan,Mass. T6	5.50	6.75	7.70	9.65	11.95
New Britn.,Conn.(10) S15	5.35	6.80	7.40	9.35	11.65
New Castle,Pa. B4	5.35	6.80	7.40	9.35	....
New Castle,Pa. E5	5.50	6.80	7.40	9.35	11.65
New Haven,Conn. D2	5.85	6.75	7.35	....	....
New York W3	....	7.10	7.70	9.65	11.95
Pawtucket,R.I. NS:					
Cleve.or Pitts.Base	....	6.80	7.40	9.35	11.65
Worcester,Mass. Base	5.85	7.10	7.70	9.65	11.95
Sharon,Pa. S3	5.35	6.80	7.40	9.35	11.65
Trenton,N.J. R5	....	7.10	7.70	9.65	11.95
Wallingford,Conn. W2	5.85	6.75	7.35	9.30	11.60
Weirton,W.Va. W6	5.35	6.80	7.40	9.35	11.65
Worcester,Mass. A7	4.95	6.75	7.70	9.65	11.95
Worcester,Mass. T6	5.50	6.75	7.70	9.65	11.95
Youngstown C8	....	6.80	7.40	9.35	11.65

Spring Steel (Tempered)

Trenton,N.J. R5	....	10.30	12.50	15.35
Harrison,N.J. C18	....	10.30	12.50	15.35
New York W2	....	10.30	12.50	15.35

Midland,Pa. C18 ..... 5.85
New Britn.Conn.(10) S15 5.45
Sharon,Pa. S3 ..... 5.85
Youngstown U5 ..... 5.50

STRIP, Cold-Rolled Carbon

Anderson,Ind.(40) G6	5.50
Berea,O. C7	6.60
Bridgeport,Conn.(10) S15	5.35
Butler,Pa. A10	4.65
Cleveland A7, J5	4.65
Dearborn,Mich. D3	5.60
Detroit D2	5.60
Detroit M1	5.45
Dover,O.(40) G6	5.50
Ecorse,Mich. G5	4.85
Follansbee,W.Va. F4	5.35
Fontana,Calif. K1	6.30
Franklin Park,Ill.(40) T6	4.90
Ind.Harbor,Ind. I-2	4.90
Lackawanna,N.Y. B2	4.65
Los Angeles C1	6.40
Mattapan,Mass. T6	5.50
Middletown,O. A10	4.65
New Britain(10) S15	5.35
New Castle,Pa. B4	5.35
New Castle,Pa.(40) E5	5.25
New Haven,Conn. D2	5.85
New Haven,Conn. A7	5.15
Pawtucket,R.I. R3	6.00
Pawtucket,R.I.(21) NS	5.85
Riverdale,Ill.(40) A1	4.90
Rome,N.Y. R6	5.10
Sharon,Pa. S3	5.35
SparrowsPoint,Md. B2	4.65
Trenton,N.J. R5	6.00
Wallingford,Conn. W2	5.85
Warren,O.(40) T5	5.25
Warren,O. R2	4.65
Weirton,W.Va. W6	4.65
Youngstown C8 (40)	5.25
Youngstown Y1	4.65

STRIP, Electro Galvanized

Dover,O. G6	5.50
Warren,O. T5	5.25
Weirton,W.Va. W6	4.65
Youngstown C8	5.25

Key to Producers

A1 Acme Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A7 American Steel & Wire
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.
A13 American Cladmetals Co.

B1 Bacock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B6 Bolardi Steel Corp.
B8 Braeburn Alloy Steel
B11 Buffalo Bolt Co.
B12 Buffalo Steel Co.
B14 A. M. Byers Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div. Borg-Warner Corp.
C4 Carpenter Steel Co.
C5 Central Iron & Steel Div. Barium Steel Corp.
C7 Cleve. Cold Rolling Mills
C8 Cold Metal Products Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Steel Corp.

D2 Detroit Steel Corp.
D3 Detroit Tube & Steel
D4 Disston & Sons, Henry
D6 Driver Harris Co.
D7 Dickson Weatherproof Nail Co.

E1 Eastern Gas&Fuel Assoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.

F2 Firth Sterling Steel
F3 Fitzsimons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div. Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
G2 Globe Iron Co.
G3 Globe Steel Tubes Co.
G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.

H1 Hanna Furnace Corp.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div. Borg-Warner Corp.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Jonhson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Electric Steel
L5 Lockhart Iron & Steel
L6 Lone Star Steel Co.
L7 Lukens Steel Co.

STRIP, Cold-Rolled Alloy Steel

Bridgeprt,Conn.(10)81S	10.75
Carnegie,Pa. 81S	10.60
Cleveland A7	10.90
Dover,O. G6	10.50
Fontana,Calif. K1	11.65
Harrison,N.J. C1S	10.60
Midland,Pa. C1S	10.60
NewBrtn,Conn.(10)81S	10.75
Pawtucket,R.I.(11) NS	10.75
Pawtucket,R.I.(12) NS	11.05
Sharon,Pa. S3	10.60
Worcester,Mass. A7	10.30
Youngstown C8	10.60

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10	3.75
Warren,O. R2	4.10

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2	5.25

TIGHT COOPERAGE HOOP

Atlanta A11	4.05
Riverdale,Ill. A1	3.90
Sharon,Pa. S3	4.15
Youngstown U5	3.75

WIRE, Tire Bead

Bartonville,Ill.(1) K4	10.90
Monessen,Pa. P16	11.40
Roebling,N.J. R5	11.55

WIRE, Merchant Quality

(6 to 8 gage)	An'ld	Galv.
AlabamaCity R2	5.70	5.95
Aliquippa J5	5.70	6.15
Atlanta A11	5.95	6.40
Bartonville(19)K4	5.70	6.15
Buffalo W12	4.85	
Cleveland A7	5.70	6.15
Crawfordsville M8	5.95	6.40
Donora,Pa. A7	5.70	6.15
Duluth,Minn. A7	5.70	6.15
Fairfield T2	5.70	6.15
Houston,Tex. S5	6.10	6.55
Johnstown B2	5.70	6.15
Joliet,Ill. A7	5.70	6.15
KansasCity,Mo. S5	6.30	6.75
Kokomo C16	5.80	6.05
LosAngeles B3	6.65	
Minnequa C10	5.95	6.45
Monessen P7	5.95	6.40
Palmer W12	5.15	
Pitts.,Calif. C11	6.65	6.80
Prtsmth.(18)P12	6.10	6.60
Rankin A7	5.70	6.15
So.Chicago R2	5.70	5.95
So.S.Fran. C10	6.65	7.10
SparrowsPt. B2	5.80	6.25
Sterling,Ill.(1)N15	5.70	6.15
Struthers,O. Y1	5.70	6.15
Torrance,Cal. C11	6.65	
Worcester A7	6.00	6.45

ROPE WIRE

	(A)	(B)
Alton,Ill. L1	8.65	8.90
Bartonville,Ill. K4	8.55	8.80
BuffaloW12	8.55	8.80
Fostoria,O. S1	8.85	9.10
Johnstown,Pa. B2	8.55	8.80
Monessen,Pa. P16	8.55	8.80
Monessen,Pa. P7	8.80	9.05
Palmer,Mass.W12	8.85	9.10
Portsmouth,O.P12	8.55	8.80
Roebling,N.J. R5	8.85	9.10
SparrowsPt. B2	8.65	8.90
Struthers,O. Y1	8.55	8.80
Worcester J4, T6	8.85	9.10

(A) Plow and Mild Plow
(B) Improved Plow.

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2	4.85
Aliquippa,Pa. J5	4.85
Atlanta A11	5.10
Alton,Ill. L1	5.05
Bartonville,Ill.(1) K4	4.85
Buffalo W12	4.85
Chicago W13	5.10
Cleveland A7, C20	4.85
Crawfordsville,Ind. M8	5.10
Donora,Pa. A7	4.85
Duluth,Minn. A7	4.85
Fairfield,Ala. T2	4.85
Fostoria,O.(24) S1	5.35
Houston S5	5.25
Johnstown,Pa. B2	4.85
Joliet,Ill. A7	4.85
KansasCity,Mo. S5	5.45
Kokomo,Ind. C16	4.95
LosAngeles B3	5.80
Minnequa,Colo. C10	5.10
Monessen,Pa. P7	5.10
Newark (6-8 ga. I-1	5.50
No.Tonawanda B11	4.85
Palmer,Mass. W12	5.15
Pittsburg,Calif. C11	5.80
Portsmouth,O. P12	5.25
Rankin,Pa. A7	4.85
So.Chicago,Ill. R2	4.85
So.SanFrancisco C10	5.80
SparrowsPoint,Md. B2	4.95
Sterling,Ill.(1) N15	4.85
Struthers,O. Y1	4.85
Torrance,Calif. C11	5.80
Waukegan,Ill. A7	4.85
Worcester,Mass. A7, T6	5.15

WIRE, Cold-Rolled Flat

Anderson,Ind. G6	6.20
Buffalo W12	6.35
Cleveland A7	5.85
Crawfordsville,Ind. M8	6.20
Detroit D2	6.20
Dover,O. G6	6.20
Fostoria,O. S1	6.00
Kokomo,Ind. C16	5.70
FrankfortPark,Ill. T6	6.20
Massillon,O. R8	5.85
Monessen,Pa. P16	5.85
Monessen,Pa. P7	6.10
NewHaven,Conn. D2	6.50
Pawtucket,R.I.(12) NS	6.85
Trenton,N.J. R5	6.15
Worcester,Mass. A7	6.15
Worcester,Mass. T6	6.50
Worcester,Mass. W12	6.65

WIRE, Galv'd ACSR for Cores

Bartonville,Ill. K4	8.50
Monessen,Pa. P16	8.50
Roebling,N.J. R5	8.80
SparrowsPoint,Md. B2	8.60
Johnstown,Pa. B2	8.50

WIRE (16 gage)	An'l'd Stone	Galv. Stone
Aliquippa J5	10.15	12.15
Bartonville(1)K4	10.25	11.95
Cleveland A7	10.25	12.15
Crawfordsville M8	10.30	12.00
Fostoria,O. S1	10.40	12.00
Johnstown B2	10.25	12.15
Kokomo C16	10.25	11.95
Minnequa C10	10.40	12.40
Palmer,Mass.W12	10.25	12.15
Pitts.Cal. C11	10.60	12.50
Prtsmth.(18) P12	10.55	12.30
SparrowsPt. B2	10.35	12.25
Waukegan A7	10.25	12.15

WIRE, MB Spring, High Carbon

Aliquippa,Pa. J5	6.25
Alton,Ill. L1	6.45
Bartonville,Ill.(1) K4	6.25
Buffalo W12	6.25
Cleveland A7	6.25
Donora,Pa. A7	6.25
Duluth,Minn. A7	6.25
Fostoria,O. S1	6.25
Johnstown,Pa. B2	6.25
LosAngeles B3	7.20
Milbury,Mass(12) N6	8.60
Monessen,Pa. P7, P16	6.25
Palmer,Mass. W12	6.55
Pittsburg,Calif. C11	7.20
Roebling,N.J. R5	6.55
Portsmouth,O. P12	6.25
So.Chicago,Ill. R2	6.25
So.SanFrancisco C10	7.20
SparrowsPoint,Md. B2	6.35
Struthers,O. Y1	6.25
Trenton,N.J. A7	6.55
Waukegan,Ill. A7	6.25
Worcester A7, T6, W12	6.55
Worcester,Mass. J4	6.75

WIRE, Fine & Weaving (8" Coils)

Bartonville,Ill.(1) K4	8.90
Buffalo W12	8.90
Chicago W13	8.90
Cleveland A7	8.90
Crawfordsville,Ind. M8	8.95
Fostoria,O. S1	8.90
Johnstown,Pa. B2	8.90
Kokomo,Ind. C16	8.90
Monessen,Pa. P16	8.90
Palmer,Mass. W12	9.20
Portsmouth,O. P12	8.90
Roebling,N.J. R5	9.20
Waukegan,Ill. A7	8.90
Worcester,Mass. A7, T6	9.20

WIRE, Barbed

	Col.
AlabamaCity,Ala. R2	137
Aliquippa,Pa. J5	141
Atlanta A11	144
Bartonville,Ill.(19) K4	144
Crawfordsville,Ind. M8	146
Donora,Pa. A7	141
Duluth,Minn. A7	141
Fairfield,Ala. T2	141
Houston,Tex. S5	149
Johnstown,Pa. B2	141
Joliet,Ill. A7	141
KansasCity,Mo. S5	153
Kokomo,Ind. C16	143
Minnequa,Colo. C10	147
Monessen,Pa. P7	146
Pittsburg,Calif. C11	161
Portsmouth,O.(18) P12	148
Rankin,Pa. A7	141
So.Chicago,Ill. R2	137
So.SanFran.,Calif. C10	161
SparrowsPoint,Md. B2	143
Sterling,Ill.(1) N15	141

BALE TIES, Single Loop

	Col.
AlabamaCity,Ala. R2	123
Atlanta A11	126
Bartonville,Ill.(19) K4	123
Crawfordsville,Ind. M8	132
Donora,Pa. A7	123
Duluth,Minn. A7	123
Fairfield,Ala. T2	123
Joliet,Ill. A7	123
KansasCity,Mo. S5	135
Kokomo,Ind. C16	125
Minnequa,Colo. C10	128
Pittsburg,Calif. C11	147
So.Chicago,Ill. R2	123
So.SanFran.,Calif. C10	147
SparrowsPoint,Md. B2	125
Sterling,Ill.(1) N15	123

WIRE, Upholstery Spring

Aliquippa,Pa. J5	5.90
Alton,Ill. L1	6.10
Buffalo W12	5.90
Cleveland A7	5.90
Donora,Pa. A7	5.90
Duluth,Minn. A7	5.90
Johnstown,Pa. B2	5.90
LosAngeles B3	8.85
Monessen,Pa. P7, P16	5.90
NewHaven,Conn. A7	6.20
Palmer,Mass. W12	6.20
Pittsburg,Calif. C11	6.85
Portsmouth,O. P12	5.90
Roebling,N.J. R5	6.20
So.Chicago,Ill. R2	5.90
So.SanFrancisco C10	6.85
SparrowsPoint,Md. B2	6.00
Torrance,Calif. C11	6.85
Trenton,N.J. A7	6.20
Waukegan,Ill. A7	5.90
Worcester,Mass. A7	6.20

WOVEN FENCE, 9-15½ga.

	Col.
AlabamaCity,Ala. R2	127
Ala.City,Ala. 17-19ga.R2	214
Aliquippa,Pa.9-14½ga.J5	131
Atlanta A11	134
Bartonville,Ill.(19) K4	131
Crawfordsville,Ind. M8	133
Donora,Pa. A7	131
Duluth,Minn. A7	131
Fairfield,Ala. T2	131
Houston,Tex. S5	139
Johnstown,Pa. B2	131
Johnstown,17ga.,6" B2	205
Johnstown,17ga.,4" B2	208
Joliet,Ill. A7	131
KansasCity,Mo. S5	143
Kokomo,Ind. C16	133
Minnequa,Colo. C10	133
Monessen,Pa. P7	136
Pittsburg,Calif. C11	154
Portsmouth,O.(18) P12	138
Rankin,Pa. A7	131
So.Chicago,Ill. R2	127
Sterling,Ill.(1) N15	131

FENCE POSTS

Chicagofits,Ill. C2	140
Duluth,Minn. A7	125
Franklin,Pa. F5	140
Huntington,W.Va. W7	140
Johnstown,Pa. B2	140
Marion,O. P11	140
Minnequa,Colo. C10	130
Moline,Ill. R2	136
So.Chicago,Ill. R2	140
Tonawanda,N.Y. B12	140
Williamsport,Pa. S19	150

TRACK BOLTS (20) Treated

KansasCity,Mo. S5	9.85
Lebanon,Pa.(31) B2	9.85
Minnequa,Colo. C10	9.85
Pittsburgh O3, P14	9.85
Seattle B3	10.35

NAILS & STAPLES, Stock

To dealers & mfrs.(7)	Col.
AlabamaCity,Ala. R2	118
Aliquippa,Pa.(13) J5	118
Atlanta A11	121
Bartonvill,Ill.(19) K4	118
Chicago,Ill. W13	118
Cleveland A9	123
Crawfordsville,Ind. M8	122
Donora,Pa. A7	118
Duluth, Minn. A7	118
Fairfield,Ala. T2	118
Galveston,Tex. D7	126
Houston,Tex. S5	126
Johnstown,Pa. B2	118
Joliet,Ill. A7	118
KansasCity,Mo. S5	130
Kokomo,Ind. C16	120
Minnequa,Colo. C10	123
Monessen,Pa. P7	124
Pittsburg,Calif. C11	127
Portsmouth,O. P12	124
Rankin,Pa. A7	118
So.Chicago,Ill. R2	118
SparrowsPoint,Md. B2	120
Sterling,Ill.(1) N15	118
Torrance,Calif. C11	138
Worcester,Mass. A7	124

NAILS, Cut (100 lb keg)

To dealers (33)	
Conshohocken,Pa. A3	$7.35
Wheeling W.Va. 10	7.35

TIE PLATES

Fairfield,Ala. T2	4.50
Gary,Ind. U5	4.50
Ind.Harbor,Ind. I-2	4.56
Lackawanna,N.Y. B2	4.50
Minnequa,Colo. C10	4.50
Pittsburg,Calif. C11	4.65
Seattle B3	4.65
Steelton,Pa. B2	4.50
Torrance,Calif. C11	4.65

JOINT BARS

Bessemer,Pa. U5	4.70
Fairfield,Ala. T2	4.70
Ind.Harbor,Ind. I-2	4.70
Joliet,Ill. U5	4.70
Lackawanna,N.Y. B2	4.70
Minnequa,Colo. C10	4.70
Steelton,Pa. B2	4.70

STANDARD TRACK SPIKES

Ind.Harbor,Ind. I-2, Y1	6.15
KansasCity,Mo. S5	6.40
Lebanon,Pa. B2	6.15
Minnequa,Colo. C10	6.15
Pittsburgh J5	6.15
Seattle B3	6.60
So.Chicago,Ill. R2	6.15
Struthers,O. Y1	6.15
Youngstown R2	6.15

AXLES

Ind.Harbor,Ind. S13	5.60
Johnstown,Pa. B2	5.60

RAILS	Std. No. 1	Std. No. 2	Std. All No. 2	Tee Rails 60 lb. Under
Bessemer,Pa. U5	3.60	3.50	3.55	4.00
Ensley,Ala. T2	3.60	3.50	...	4.00
Fairfield,Ala. T2	...	...	...	4.00
Gary,Ind. U5	3.60	3.50	3.55	...
Huntington,W.Va. W7	...	...	...	5.00
Ind.Harbor,Ind. I-2	3.60	3.50	3.55	...
Johnstown,Pa. B2	...	...	...	(18)4.00
Lackawanna,N.Y. B2	3.60	3.50	...	4.00
Minnequa,Colo. C10	3.60	3.50	...	4.50
Steelton,Pa. B2	3.60	3.50	...	...
Williamsport,Pa. S19	...	...	...	4.75

TOOL STEEL

Grade	$ per lb
Regular Carbon	0.230
Extra Carbon	0.270
Special Carbon	0.325
Oil Hardening	0.350
5% Cr Hot Work	0.350
Hi-Carbon-Cr	0.635

Grade by Analysis

W	Cr	V	Co	
18	4	1	....	1.505
18	4	2	....	1.650
20.25	4.25	1.6	12.25	3.535-3.675
19	4	2	7	2.460
18.25	4.25	1	4.75	2.125
18	4	2	9	2.445-2.45
13.5	4	3	....	1.6025

W	Cr	V	Mo	
6.4	4.5	1.9	5	0.96-0.965
6	4	3	6	1.190
1.5	4	1	8.5	0.810

Tool steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, D4, F2, J3, L3, M14, S8, U4, V2 and V3.

Footnotes:

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(5) Philadelphia, del.
(6) Chicago or Birm. base.
(7) To jobbers, 3 cods. lower.
(8) 16 gage and heavier.
(9) 6 in. and narrower.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass. base.
(13) Add 0.5bc for 17 Ga. & heavier.
(14) Also wide flange beams.
(15) ¼" and thinner.
(16) 40 lb and under.
(17) Flats only.
(18) To dealers.
(19) Chicago & Pitts. base.
(20) 0.25c off for untreated.
(21) New Haven, Conn., base.
(22) Del. San Francisco Bay area.
(23) 28 Ga. 36" wide.
(24) Deduct 0.20c, finer than 15 Ga.
(25) Bar mill bands.
(26) Reinforcing, mill length, to fabricators; to consumers, 5.60c.
(27) Bar mill sizes.
(28) Rondorized.
(29) Subject to 10% increase.
(30) Sheared; add 0.35c for universal mill.
(31) Not annealed.
(32) Rd. or square edge.
(33) To jobbers, deduct 20c.
(34) 7.25c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) 15 gage & lighter; 60" & narrower.
(38) 14 gage & lighter; 48" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.25c higher.

Key to Producers

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M5 Medart Co.
M6 Mercer Tube & Mfg. Co.
M8 Mid-States Steel & Wire
M9 Midvale Co.
M12 Moltrup Steel Products
M13 Monarch Steel Co.
M14 McInnes Steel Co.

N2 National Supply Co.
N3 National Tube Div.
N5 Nelsen Steel & Wire Co.
N6 NewEng.-HighCarb.Wire
N8 Newman-Crosby Steel
N12 Niles Rolling Mill Div.
N14 Nrthwst. Steel Roll. Mills
N15 Northwestern S.&W. Co.
N16 New Delphos Mfg. Co.

O3 Oliver Iron & Steel Corp.
O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke & Chem.
P7 Pittsburgh Steel Co.
P9 Pittsburgh Tube Co.
P11 Pollak Steel Co.
P12 Portsmouth Division, Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.

R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R7 Rotary Electric Steel Co.
R8 RelianceDiv.,EatonMfg.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S5 Sheffield Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S9 Sluss-Sheffield S.&I. Co.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S16 Struthers Iron & Steel
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel
T2 Tenn. Coal & Iron Div.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div. Am. Rad. & Stan. San.

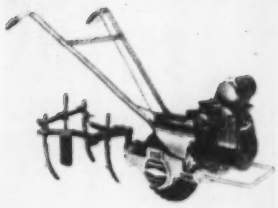
U1 Ulster Iron Works
U4 Universal Cyclops Steel
U5 United States Steel Co.

V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Steel Co.

W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W7 W. Va. Steel & Mfg. Co.
W8 West.Auto.Mach.Screw
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div. International Harvester
W15 Woodward Iron Co.
W16 Wyckoff Steel Co.
Y1 YoungstownSheet&Tube

why *stock steel in long lengths?*

when you can eliminate steps in your own manufacturing and Save Money!



This Power Cultivator Mfg saved money

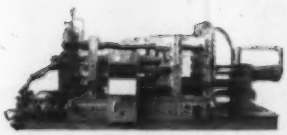
No manufacturer need stock standard lengths any longer. Nor need he figure processing these in his own plant to smaller dimensions.

We stock material in long lengths or coils and we process to exact sizes, which provides manufacturers with both processing and storage savings.

Our money saving services really eliminate manufacturing steps in your plant. These include sawing, flame cutting, drawing, shearing, rolling, cutting and slitting. And you get your steel at the *right price, properly packaged* and delivered *on time*.

Phone our nearest office today and one of our Sure Spec sales engineers will gladly give you the facts that can help you save considerable money.

This Fire Engine Mfg saved money



This Die Casting Machine Mfg saved money

PRODUCTS WAREHOUSED

Sheet and Strip HR, HRP, CR • Cold Finished Bars & Hot Rolled Bars, both carbon & alloy Plates • Galvanized, Long Ternes and Tin Mill Products • Seamless Tubing • Drill Rod

SERVICES

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STANDARD PIPE, T & C

BUTTWELD Size Inches	List Per Ft	Pounds Per Ft	Carload Discounts from List, % Black A	Black B	Black C	Galvanized D	Galvanized E	Galvanized F
⅛	5.5¢	0.24	34.0	32.0	....	+0.5	+2.5	....
¼	6.0	0.42	38.5	36.5	....	+3.5	+5.5	....
⅜	6.0	0.57	33.5	31.5	....	+10.5	+12.0	....
½	8.5	0.85	36.0	34.0	33.0	12.0	10.0	11.0
¾	11.5	1.18	39.0	37.0	36.0	16.0	14.0	15.0
1	17.0	1.68	41.5	39.5	40.5	19.5	17.5	18.5
1¼	23.0	2.28	43.0	40.0	41.0	20.5	18.5	19.5
1½	27.5	2.73	43.5	40.5	41.5	21.5	19.5	20.5
2	37	3.66	43.0	41.0	42.0	22.0	20.0	21.0
2½	58.5	5.82	43.5	41.5	42.5	23.0	21.0	22.0
3	76.5	7.62	43.5	41.5	42.5	23.0	21.0	22.0

Column A: Etna, Pa. N2 and 34¼ % on 3½", 4"; Butler, Pa. ¼-⅜", F6; Benwood, W. Va., 3½ points lower on ¼", 1½ points lower on ⅜", and 2 points lower on ½". W10; Sharon, Pa. M8, 1 point higher on ¼", 2 points lower on ⅜" and ½"; Wheatland, Pa. W9, 2 points lower on ¼", ⅜", ½". Following make ¾" and larger: Lorain, O., N3; Youngstown R2 and 34¼ % on 3½" and 4"; Youngstown Y1; Aliquippa, Pa. J5; Fontana, Calif. K1 quotes 11½ points lower on ½" and larger continuous weld and 24% on 3½" and 4".

Columns B & E: Sparrows Point, Md. B2.

Columns C & F: Indiana Harbor, Ind., Y1; Alton, Ill., (Gary base) 2 points lower discount L1.

Column D: Butler, Pa. F6, ¼-⅜"; Benwood, W. Va. W10, except plus 4% on ¼", plus 8% on ⅜", plus 13% on ½" and 15.5% on 3½", 4"; Sharon, Pa. M8, plus 2.5 on ¼", 1 point lower on ⅜", ½", 1½ points lower on 1" and 1¼", 2 points lower on 1½", 2" 2¼" and 3"; Wheatland, Pa. W9, add 2 points on ¼", ⅜", ½", 1 point lower on ¾", 2 points lower on 1", 1¼", 2", 1½ points lower on 1¼", 2½", 3", Etna, Pa. N2 and 15.5% on 3½", 4". Following quote only on ¼" and larger: Lorain, O. N3; Youngstown R2, and 12½ % on 3½" and 4"; Youngstown Y1, Aliquippa, Pa. J5 quotes 1 point lower on ¾", 2 points lower on 1", 1½", 2", 1¼ points lower on 1¼", 2½" and 3".

SEAMLESS AND ELECTRIC WELD Size Inches	List Per Ft	Pounds Per Ft	Carload Discounts from List, % Seamless Black A	Seamless Galv. B	Elec. Weld Black C	Elec. Weld Galv. D
2	37.0¢	3.66	39.5	8.0	39.5	8.0
2½	58.5	5.83	33.5	11.5	33.5	11.5
3	78.5	7.68	33.5	11.5	33.5	11.5
3½	93.0	9.30	34.5	13.5	34.5	13.5
4	$1.00	10.89	34.5	13.5	34.5	13.5
5	1.48	14.81	37.0	16.0	37.0	16.0
6	1.93	19.18	37.0	16.0	37.0	16.0

Column A: Aliquippa J5; Ambridge N3; Lorain N3; Youngstown Y1.

Column B: Aliquippa J5 quotes 1¼ pts lower on 2", 1 pt lower on 2½-6 in.; Lorain N3; Youngstown Y1.

Columns C & D: Youngstown R2.

BOILER TUBES

Net base c.l. prices, dollars per 100 ft. mill; minimum wall thickness, cut lengths 10 to 24 ft. inclusive.

O.D. In.	B.W. Ga.	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.	Elec. Weld C.D.
1	13	13.46	16.47	15.36	15.36
1¼	13	16.09	19.71	15.61	18.19
1½	13	17.27	21.15	17.25	20.30
1¾	13	19.29	23.62	19.62	23.09
2	13	21.62	26.48	21.99	25.86
2¼	13	24.35	29.82	24.50	28.84
2½	12	26.92	32.97	26.98	31.76
2¾	12	29.66	36.32	29.57	34.76
2¾	12	32.11	39.33	31.33	36.84
3	12	34.00	41.64	32.89	38.70

CLAD STEELS

(Cents per pound)

Cladding Stainless	Plates— Carbon Base 10%	Plates— Carbon Base 20%	Strip Cold-Rolled Carbon Base 10%	Strip Cold-Rolled Carbon Base Sides	Sheets— Carbon Base 10%	Sheets— Carbon Base 20%	Sheets— Cu Base Both Sides
302	....	....	....	....	19.75	26.24–27.50	77.00
304	25.00	29.50	....	....	24.50	27.50–27.77	77.00
309	30.50	35.00	....	....	....	....	....
310	36.50	41.00	....	....	....	....	144.00
316	29.50	34.00	....	....	26.00	35.92–36.50	....
317	34.50	39.00	....	....	....	....	....
318	33.50	38.00	....	....	....	....	....
321	26.50	31.00–32.00	....	....	23.00	33.00	111.00
347	27.50	32.00	....	....	24.00	33.50–33.83	130.00
406	21.25	27.75	....	....	....	....	....
410	20.75	27.25	....	....	....	....	....
Nickel	33.55	45.15	41.00	54.00	....	....	165.00
Inconel	41.23	54.18	....	....	....	....	....
Monel	34.93	46.28	....	....	....	....	....
Copper*	....	....	23.70†	29.65‡	....	....	....

* Deoxidized. † 20.20c for hot-rolled. ‡ 26.40c for hot-rolled. Production points for carbon base products: Stainless plates, sheet, Conshohocken, Pa. A3 and New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7 and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; nickel, copper-clad strip, Carnegie, Pa., S18. Production point for copper-base sheets is Carnegie, Pa. A13.

BOLTS, NUTS

CARRIAGE, MACHINE BOLTS

(F.o.b. midwestern plants; per cent off list for less than case lots to consumers)

6 in. and shorter:	
½-in. & smaller diam.	15
⅝-in. & ⅞-in.	18.5
1-in. and larger	17.5
Longer than 6 in.:	
All diams.	14
Lag bolts, all diams.:	
6 in. and shorter	23
over 6 in. long	21
Ribbed Necked Carriage	18.5
Blank	34
Plow	34
Step, Elevator, Tap and Sleigh Shoe	21
Tire bolts	42
Boiler & Fitting-Up Bolts	31

NUTS

H.P. & C.P. Square:	Reg. Hvy.
½-in. & smaller	15 15
⅝-in. & ⅞-in.	12 6.5
1-in.-1⅛-in.	9 1
1⅛-in. & larger	7.5 1
H.P. Hex.:	
½-in. & smaller	26 22
⅝-in.-1-in.	16.5 6.5
1⅛-in.-1½-in.	12 2
1⅝-in. & larger	8.5 2
C.P. Hex.:	
½-in. & smaller	26 22
⅝-in. & ⅞-in.	23 17.5
1-in. & 1⅛-in.	19.5 12
1¼-in. & larger	12 6.5

SEMIFINISHED NUTS

American Standard

(Per cent off list for less than case or keg quantities)

	Reg.	Hvy.
½-in. & smaller	35	28.5
6 in. or shorter:		
⅝-in. & ⅞-in.	29.5	22
1-in.-1¼-in.	24	15
1⅛-in. & larger	13	8.5
		Light
⅞-in. & smaller		35
1-in. to ⅞-in.		28.5
1⅛-in. to 1¼-in.		26

STEEL STOVE BOLTS

(F.o.b. plant; per cent off list in packages)

Plain finish	48 & 10
Plated finishes	31 & 10

HEXAGON CAP SCREWS

(1020 steel, packaged; per cent off list)

¼-in. & smaller	42
⅜-in. through 1 in.	34
Longer than 6 in.:	
⅜-in. & smaller	26
⅜-in. through 1 in.	4

SQUARE HEAD SET SCREWS

(Packaged; per cent off list)

1 in. diam. x 6 in. and shorter	38
1 in. and smaller diam. x over 6 in.	26

HEADLESS SET SCREWS

(Packaged; per cent off list)

No. 10 and smaller	35
¼-in. diam. & larger	16
N.F. thread, all diams.	10

RIVETS

F.o.b. midwestern plants

Structural ½-in., larger	7.85¢
⅞-in. under	36 off

WASHERS, WROUGHT

F.o.b. shipping point, to jobbers....List to list-plus-$1.

FLUORSPAR

Metallurgical grade, f.o.b. shipping point in Ill., Ky., net tons, carloads, effective CaF_2 content 70%, $43; 60%, $40.

Imported, net ton, duty paid, metallurgical grade, $33-$35.

ELECTRODES

(Threaded, with nipples, unboxed f.o.b. plant)

GRAPHITE

Diam. Inches	Length Inches	Cents per lb
17,18,20	60,72	17.85
8 to 16	48,60,72	17.85
7	48,60	19.57
6	48,60	20.96
	CARBON	
35,40	110	8.03
30	65,84,110	8.03
24	72 to 104	8.03
17 to 20	34,90	8.03

STAINLESS STEEL

Type	Sheets	C.R. Strip	Bars Wire Structurals
301...	41.00	34.00	31.25
302...	41.25	34.75	31.50
303...	43.25	40.25	34.00
304...	43.25	38.75	33.00
309...	56.00	55.00	44.75
316...	57.00	59.00	49.25
321...	49.25	48.25	37.00
347...	53.75	53.25	41.50
410...	38.50	30.50	30.75
416...	37.00	37.00	26.25
420...	44.00	47.00	31.25
430...	39.00	31.00	26.25
501...	27.50	26.00	14.25
502...	28.50	27.00	15.25

Bait., Types 301-347 sheet, except 303 and 309 E2.

Brackenridge, Pa., Sheets A4 quotes slight variations on Types 301-347.

Bridgeville, Pa., bars, wire, sheets & strip U4.

Butler, Pa., sheets and strip except Types 303, 309, 416, 420, 501 & 502, A10.

Carnegie, Pa., sheets and strip except Types 303, 416, 501 & 502 S18.

Cleveland, strip A7.

Detroit, strip M1 quotes 34.00c on Type 301; 34.50c, 302; 38.50c, 304; 58.50c, 316; 53.00c, 347; 30.50c, 410; 31.00c, 430.

Dunkirk, N. Y., bars, wire A4 quotes slight variations on Types 301-347.

Duquesne, Pa., bars U5

Fort Wayne, Ind., bars and wire, except Types 501 & 502 J6 quotes slight variations on Types 301-347.

Gary, Ind., sheets except Type 416 U5.

Harrison, N. J., strip and wire C18.

Massillon, O., all items, R3.

McKeesport, Pa., strip, Type 410; bars & wire, Types 410 through 430 and 31.25c on Type 302, 33.75c on 303, 32.75c on 304, 48.75c on 316, 36.75c on 321, 41.25c on 347 F2.

McKeesport, Pa., bars sheets except Type 416 U5.

Middletown, O., sheets and strip except Types 303, 416, 420, 501 and 502 A10.

Midland, sheets & strip C18.

Munhall, Pa., bars U5.

Pittsburgh, sheets C18.

Reading, Pa., strip except 34.25¢ on Type 301 and 58.00c on 309; bars, except 31.50c on Type 301 and 45.25c on 309 C4.

Sharon, Pa., strip, except Types 303, 309, 416, 501, 502 and 34.25c on Type 301 S3.

So. Chicago, Ill., bars & structurals U5.

Syracuse, N. Y., bars, wire & structurals C18.

Titusville, Pa., bars U4.

Wallingford, Conn., strip W2 quotes 0.25c higher.

Washington, Pa., bars, sheets & strip, except 0.25c higher on Type 301 J3.

Washington, Pa., Types 301 through 347 sheets & strip except 303, 309; 316 sheets 62.00c, strip 64.00c W4.

Watervliet, N. Y., structurals & bars A4 quotes variations on Types 301-347.

Waukegan, bars & wire A7.

West Leechburg, Pa., strip, A4 quotes slight variations on Types 301-347.

Youngstown, strip except Types 303, 309, 316, 416 501 and 502 and 34.25c on Type 301 C8.

COAL CHEMICALS

Spot, cents per gallon, ovens	
Pure benzol	....30.00-35.00
Toluol, one deg.	...28.00-33.00
Industrial xylol	...25.00-33.50
Per ton bulk ovens	
Sulphate of ammonia	$33-$45
Cents per pound, ovens	
Phenol, 40 (carlots, non-returnable drums)	..17.25

METAL POWDERS

(Per pound, f.o.b. shipping point in ton lots for minus 100 mesh, except as otherwise noted.)

	Cents
Sponge iron	
98+% Fe, carlots	17.00
Swedish, c.l.f. New York, in bags	8.85-9.90
Electrolytic iron:	
Annealed, 99.5% Fe	43.50
Unannealed 99 + % Fe	34.50
Unannealed, 99 + % Fe (minus 325 mesh)	53.50
Powder Flakes	48.50
Carbonyl Iron: 97.9-99.5% size 5 to 10 microns	83.00-143.00
Aluminum:	
Carlots, freight allowed	29.50
Atomized, 500 lb drums, freight allowed	23.50
Antimony	73.85
Brass, 20-ton lots	30.00-33.25
Bronze, 10-ton lots	51.25-60.00
Phosphor-Copper, 30-ton lots	50.00
Copper:	
Electrolytic	27.25
Reduced	33.75
Lead	26.50
Magnesium	75.00-83.00
Manganese:	
Minus 100-mesh	57.00
Minus 35 mesh	53.00
Minus 200 mesh	63.00
Nickel unannealed	84.00
Nickel-Silver 5-ton lots	45.00
Silicon	38.50
Solder (plus cost of metal)	8.50
Stainless Steel, 302	83.00
Zinc, 10-ton lots	25.00-33.50
Tungsten	Dollars
Melting grade, 99% 60 to 200 mesh:	
1000 lb and over	4.00
Less than 1000 lb	4.15
98.5% minus 65 mesh:	
1000 lb and over	4.15
Less than 1000 lb	4.35
Molybdenum:	
99.9%, minus 300 mesh	3.94
Chromium, electrolytic 99% Cr. min.	3.50

METALLURGICAL COKE

Price per net ton

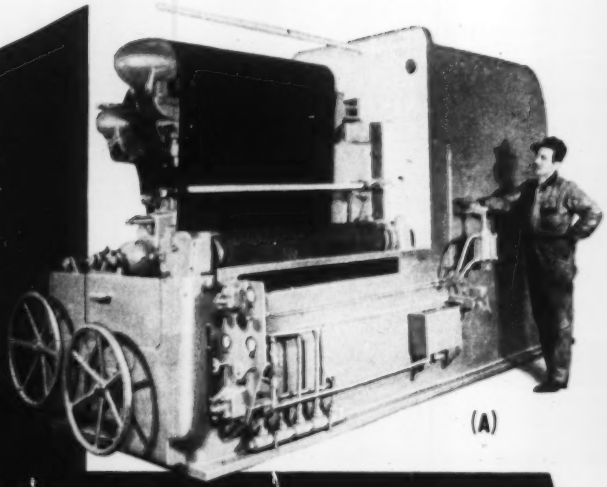
BEEHIVE OVENS

Connellsvill.fur.	$14.50-15.00
Connellsvill.fdy.	17.00-18.00
New River foundry	21.50
Wise county, foundry	15.94
Wise county, furnace	15.20

OVEN FOUNDRY COKE

Kearney, N. J. ovens	$23.75
Everett, Mass., Ovens New England, del.	*24.80
Chicago ovens	23.00
Chicago, del.	24.50
Terre Haute, ovens	23.50
Milwaukee, ovens	23.75
Indianapolis, ovens	23.75
Chicago, del.	26.43
Cincinnati, del.	25.85
Detroit, del.	26.85
Ironton, O., ovens	23.50
Cincinnati, del.	25.13
Painesville, O., ovens	24.00
Cleveland, del.	25.83
Erie, Pa., ovens	23.50
Birmingham, ovens	20.20
Birmingham, del.	21.90
Philadelphia, ovens	22.70
Neville Island, Pa., ovens	23.00
Swedeland, Pa., ovens	23.00
St. Louis, ovens	
St. Louis, del.	25.40
Portsmouth, O., ovens	23.50
Cincinnati, del.	25.13
Detroit, ovens	24.00
Detroit, del.	25.00
Buffalo, del.	26.99
Flint, del.	26.50
Pontiac, del.	25.47
Saginaw, del.	26.93

* Or within $4.13 freight zone from works.



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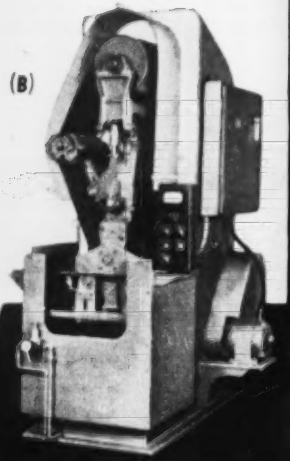
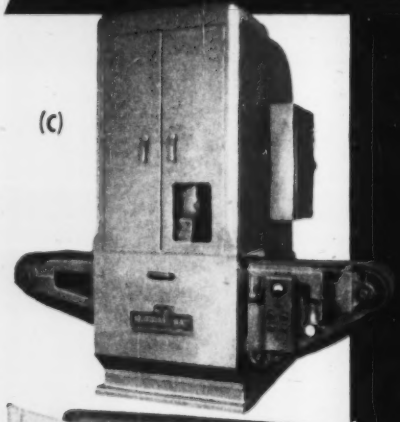


(B)

IF THE STOCK IS FLAT
MICRO-POLISH



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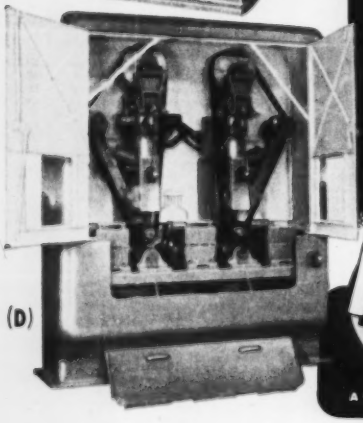

(D)

can automatically finish your job faster, better or cheaper regardless of size, shape or material.

Murray-Way, "engineered-to-the-job", Micro-Polish equipment is now being used the country over in every type of application, on every conceivable kind of material.

Micro-Polish is an amazingly versatile and consistently successful automatic polishing method useful on any job from the prepolishing of low grade steel sheet, to meet high quality job specifications, to the production sharpening and polishing of pruning tools.

Micro-Polish can precision finish any size, shape or length of sheet, strip or blanked stock in ferrous or non-ferrous metals, wood, fiber, plastic, rubber or leather, by wet or dry process.

The typical Micro-Polish equipment shown here demonstrates how Murray-Way engineers have adapted the process to individual job requirements.

A. A Micro-Polish giant used in reclamation grinding of steel strip.

B. One of our smaller units used in polishing narrow bi-metal stock.

C. A versatile unit using belt conveyor to polish a variety of flat stampings and forgings.

D. A space saver unit for polishing flat bar stock. Two heads and two grades of belt grain accomplish the complete job without rehandling.

Murray-Way engineers will gladly show you how this time and cost saving method can improve your polishing operation.

MURRAY WAY

THE MURRAY-WAY CORPORATION

POST OFFICE BOX 180 — BIRMINGHAM, MICHIGAN

AUTOMATIC POLISHING, BUFFING, GRINDING EQUIPMENT

WAREHOUSE STEEL PRODUCTS

(Representative prices, cents per pound, for delivery within switching limits, subject to extras.)

	SHEETS			STRIP		BARS			Standard Structural Shapes	PLATES	
	H.R. 18 Ga., Heavier*	C.R.	Gal. 10 Ga.†	H.R.*	C.R.*	H.R. Bds.	C.F. Bds.	H.R. Alloy 4140‡*		Carbon	Floor
New York (city)	6.40	7.11	8.55	7.05	...	6.49	7.29	9.28	6.37	6.74	7.98
JerseyCity(c'try)	6.10	6.91	8.25	6.75	...	6.19	6.99	10.48	6.07	6.44	7.68
Boston (city) ..	6.40	7.18	8.65	6.70	...	6.36	7.08	10.80	6.42	6.65	7.84
Boston (c'try) ..	6.20	6.98	8.45	6.50	...	6.16	6.88	10.60	6.22	6.45	7.64
Phila. (city) ..	6.04	6.97	8.35	6.60	7.11	6.29	7.16	10.48	6.10	6.38	7.29
Phila. (c'try) ..	5.79	6.72	8.10	6.35	6.86	6.04	6.91	10.23	5.85	6.13	7.04
Balt. (city) ..	5.74	7.00	8.40	6.23	...	6.21	6.83	...	6.33	6.33	7.57
Balt. (c'try) ..	5.54	6.80	8.20	6.03	...	6.01	6.63	...	6.13	6.13	7.37
Norfolk, Va. ..	6.78	...	...	...	...	6.04	7.30	...	6.30	6.30	7.15
Richmond, Va. ..	5.74	6.57	8.38	6.14	...	5.91	6.59	...	6.72	6.86	8.00
Wash. (w'hse) ..	6.05	7.26	8.49	6.50	...	6.50	7.26	...	6.60	6.65	7.86
Buffalo (del.) ..	5.74	6.52	8.43	6.30	...	5.72	6.65	10.68††	6.02	6.18	7.58
Buffalo (w'hse) ..	5.54	6.32	8.23	6.10	...	5.52	6.45	10.48††	5.82	5.98	7.38
Pitts. (w'hse) ..	5.50	6.32	7.85	5.59	6.90	5.45	6.20	10.30††	5.65	5.65	6.89
Detroit (w'hse) ..	5.79	6.50	8.47	6.15	7.15	5.74	6.64	10.45	6.09	6.14	7.21
Cleveland (del.)	5.74	6.52	8.16	5.85	7.14	5.82	6.60	8.91	6.15	6.02	7.39
Cleve. (w'hse) ..	5.54	6.32	7.96	5.65	6.94	5.62	6.40	8.71	5.95	5.82	7.19
Cincin. (w'hse) ..	5.84	6.38	8.29	5.77	...	5.75	6.64	10.49	6.09	6.14	7.28
Chicago (city) ..	5.74	6.52	8.05	5.89	...	5.67	6.50	10.30††	5.85	5.90	7.09
Chicago (w'hse) ..	5.54	6.32	7.85	5.49	...	5.47	6.30	10.10††	5.65	5.70	6.89
Milwau. (city) ..	5.90	...	8.21	5.85	...	5.83	6.81	10.46††	6.01	6.06	7.25
Milwau. (c'try) ..	5.70	...	8.01	5.65	...	5.63	6.61	10.26††	5.81	5.86	7.05
St. Louis (del.) ..	6.02	6.80	8.33	6.56	...	5.95	6.88	10.58	6.22	6.27	7.46
St. L. (w'hse) ..	5.82	6.60	8.13	6.36	...	5.75	6.68	10.38	6.02	6.07	7.26
Kans. City(city) ..	6.40	7.20	8.40	6.35	...	6.35	7.20	...	6.50	6.60	7.80
Kans.City(w'hse) ..	6.20	7.00	8.20	6.15	...	6.15	7.00	...	6.30	6.40	7.60
Birm'hm (city) ..	5.75	6.55	6.90[2]	5.70	...	5.70	7.53	...	5.85	6.10	8.25
Birm'hm(w'hse) ..	5.60	6.40	6.75[2]	5.55	...	5.55	7.53	...	5.70	5.95	8.23
Los Ang. (city) ..	6.50	8.30[2]	9.50	6.60	10.65	6.45	8.35	11.50	6.50	6.50	8.75
L. A. (w'hse) ..	6.30	8.10[2]	9.30	6.40	10.45	6.25	8.15	11.30	6.30	6.30	8.55
Seattle-Tacoma ..	7.07	8.64	9.65	7.70	...	6.70	9.05	10.35	6.54	6.83	8.73
San Francisco ..	6.64	7.88[2]	8.85[2]	6.43	...	6.72	8.20	11.15	6.45	6.50	8.50

* Prices do not include gage extras; † prices include gage and coating extras, except Birmingham (coating extra excluded) and Los Angeles (gage extra excluded); ‡ includes extra for 10 gage; ‖ as rolled; ** 16 gauge; †† as annealed; ‡‡ 15 gage. Base quantities, 2000 to 9999 lb except as noted Cold-rolled strip, 2000 lb and over; cold-finished bars, 2000 lb and over; [2]—500 to 1499 lb; [3]—450 to 1499 lb; [4]—3600 lb and over; [5]—1000 to 1999 lb

Ores

Lake Superior Iron Ore

Gross ton, 51½% (natural), lower lake ports.

After adjustment for analysis, prices will be increased or decreased as the case may be for increases or decreases after Dec. 2, 1950, in applicable lake vessel rates, upper lake rail freights, dock handling charges and taxes thereon.

Old range bessemer	$8.70
Old range nonbessemer	8.55
Mesabi bessemer	8.45
Mesabi nonbessemer	8.30
High phosphorus	8.30

Eastern Local Ore

Cents per unit del., E. Pa.

Foundry and basic 56-62% concentrates contract	17.00

Foreign Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60 to 68% :	
Spot	nom.
Long-term contract	$20.00-24.00
North African hematites (spot)	26.00-28.00
Brazilian iron ore, 68-69% (spot)	30.00-31.00

Tungsten Ore

Net ton unit, duty paid

Foreign wolframite and scheelite, per net ton unit	$65.00
Domestic scheelite mines	65.00

Manganese Ore

Manganese, 48% nearby, $1.18-$1.22 per long ton unit, c.i.f. U. S. ports, duty for buyer's account; shipments against old contracts for 48% ore are being received from some sources at 85c-87c.

Chrome Ore

Gross ton, f.o.b. cars, New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., or Tacoma, Wash.

Indian and African	
48% 2.8:1	$39.00-42.00
48% 3:1	44.00-45.00
48% no ratio	30.00-32.00
South African Transvaal	
44% no ratio	$27.00-28.00
48% no ratio	34.00-35.00
Brazilian	
44% 2.5:1 lump	nom.
Rhodesian	
45% no ratio	$29.00
48% no ratio	31.50-32.00
48% 3:1 lump	50.00-51.00
Domestic—rail nearest seller	
48% 3:1	$39.00

Molybdenum

Sulphide concentrates per lb. molybdenum content, mines	$1.00

REFRACTORIES

(Ceiling prices, effective Feb. 12, 1952, per 1000 units)

Fire Clay Brick

High-Heat Duty: Pueblo, Colo., $85; Ashland, Grahn, Hayward, Hitchins, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lochhaven, Lumber, Orviston, West Decatur, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parral, Portsmouth, O., Ottawa, Ill., Stevens Pottery, Ga., Woodbridge, N. J., $94.60; Salina, O., $99.60; Niles, O., $104; Los Angeles, Pittsburg, Calif., $126.

Silica Brick

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Portsmouth, O., $94.60; Hays, Pa., $100.10; Niles, O., $102; E. Chicago, Ind., Joliet, Rockdale, Ill., $104.50; Cutler, Utah, $111; Los Angeles, $117.

Insulating Fire Brick

2300° *F:* Massillon, O., $170; Clearfield, Pa., $171; Augusta, Ga., Beaver Falls, Zelienople, Pa., Mexico, Mo., $178.

Ladle Brick

Dry Pressed: Bessemer, Ala., $61.60; Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Pa., Wellsville, O., $66; Mexico, Mo., $70; Clearfield, Pa., Portsmouth, O., $79.20; Perla, Ark., $88; Los Angeles, $105; Pittsburg, Calif., $106.

Sleeves

Reesdale, Pa., $121; Johnstown, Pa., $121.30; Clearfield, Pa., $128.70; St. Louis, $131.45; Athens, Tex., $134.20.

Nozzles

Reesdale, Pa., $193.60; Johnstown, Pa., $198.55; Clearfield, Pa., $209; St. Louis, $213.95; Athens, Tex., $214.50.

Runners

Reesdale, Pa., $150.70; Johnstown, Pa., $154; Clearfield, Pa., $160; St. Louis, $162.25; Athens, Tex., $166.10.

High-Alumina Brick

50 *Per Cent:* Clearfield, Pa., St. Louis, Mexico, Mo., $158.40; Danville, Ill., $161.40.
60 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $200.20; Danville, Ill., $203.20.
70 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $233.20; Danville, Ill., $236.20; Clearfield, Pa., $240.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Contract, carload, lump, bulk 20.0c per lb of alloy, carload packed 20.8c, ton lot 22.3c, less ton 23.3c. Delivered. Spot add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65% Fe 1.50-3%). Contract, carload, lump, bulk 10.0c per lb of alloy, carload packed 20.2c, ton lot 22.1c, less ton 23.6c. Deld. Spot add 0.25c.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 30-43%, Fe 40-45%, C 0.20% max.). Contract, c.l. lump, bulk 7.0c per lb of alloy, c.l. packed 7.75c, ton lot 8.5c, less ton 9.35c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max.). Contract, carload, lump, packed 20.25c per lb of alloy, ton lot 21c, less ton 22.25c. Freight allowed. Spot add 0.25c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx. 3¾ lb each and containing exactly 2 lb of Cr). Contract, carload, bulk, 14.50c per lb of briquet, carload packed 15.2c, ton 16.0c, less ton 16.9c, Deld. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Contract, carload, bulk 10.95c per lb of briquet, c.l. packaged 11.75c, ton lot 12.55c, less ton 13.45c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3½ lb and containing exactly 2 lb of Mn and approx. ½ lb of Si). Contract, c.l. bulk 11.15c, per lb of briquet, c.l. packed 11.95c, ton lot 12.75c, less ton 13.65c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size — weighing approx. 5 lb and containing exactly 2 lb of Si). Contract, carload, bulk 6.95c per lb of briquet, c.l. packed 7.75c, ton lot 8.85c, less ton 9.45c. Delivered. Spot, add 0.25c.
(Small size—weighing approx. 2½ lb and containing exactly 1 lb of Si). Carload, bulk 7.1c, c.l. packed 7.9c, ton lot 8.7c, less ton 9.6c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each) $1.14 per pound of Mo contained, f.o.b. Langeloth, Pa.

NOTE: For current quotations on manganese, titanium and "other" ferroalloys, see page 213, Apr. 7 issue; for chromium, silicon, vanadium, boron, tungsten alloys, page 141, Mar. 31 issue.

CEILING PRICES, IRON AND STEEL SCRAP

Prices as set forth in Office of Price Stabilization ceiling price regulation No. 5, as amended Feb. 5, 1952.

STEELMAKING SCRAP COMPOSITE

Apr. 10	$43.00
Apr. 3	43.00
Mar. 1952	43.00
Apr. 1951	44.00
Apr. 1947 *	33.94

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

Basing point ceiling prices per gross ton from which maximum shipping prices are computed on scrap of dealer and industrial origin; and from which ceiling on-line and ceiling delivered prices are computed on scrap of railroad origin.

Basing Point	Grade 1 No. 1 Bundles Dealer, Industrial	No. 1 Heavy Melt Railroad
Alabama City, Ala.	$39.00	$41.00
Ashland, Ky.	42.00	44.00
Atlanta, Ga.	39.00	41.00
Bethlehem, Pa.	42.00	44.00
Birmingham, Ala.	39.00	41.00
Brackenridge, Pa.	44.00	46.00
Buffalo, N. Y.	43.00	45.00
Butler, Pa.	44.00	46.00
Canton, O.	44.00	46.00
Chicago, Ill.	42.50	44.50
Cincinnati, O.	43.00	45.00
Claymont, Del.	42.50	44.50
Cleveland, O.	43.00	45.00
Coatesville, Pa.	42.50	44.50
Conshohocken, Pa.	42.50	44.50
Detroit, Mich.	41.15	43.15
Duluth, Minn.	40.00	42.00
Harrisburg, Pa.	42.50	44.50
Houston, Tex.	37.00	39.00
Johnstown, Pa.	44.00	46.00
Kansas City, Mo.	39.50	41.50
Kokomo, Ind.	42.00	44.00
Los Angeles	35.00	37.00
Middletown, O.	43.00	45.00
Midland, Pa.	44.00	46.00
Minnequa, Colo.	38.00	40.00
Monessen, Pa.	44.00	46.00
Phoenixville, Pa.	42.50	44.50
Pittsburg, Calif.	35.00	37.00
Pittsburgh, Pa.	44.00	46.00
Portland, Oreg.	35.00	37.00
Portsmouth, O.	42.00	44.00
St. Louis, Mo.	41.00	43.00
San Francisco	35.00	37.00
Seattle, Wash.	35.00	37.00
Sharon, Pa.	44.00	46.00
Sparrows Pt., Md.	42.00	44.00
Steubenville, O.	44.00	46.00
Warren, O.	44.00	46.00
Weirton, W. Va.	44.00	46.00
Youngstown, O.	44.00	46.00

Differentials from Base

Differentials per gross ton for other grades of dealer and industrial scrap:

O-H and Blast Furnace Grades

2. No. 1 Bushelling	Base
3. No. 1 Heavy Melting	—$1.00
4. No. 2 Heavy Melting	— 1.00
5. No. 2 Bundles	— 1.00
6. Machine Shop Turnings	— 10.00
7. Mixed Borings and Short Turnings	— 6.00
8. Shoveling Turnings	— 6.00
9. No. 2 Bushelling	— 4.00
10. Cast Iron Borings	— 6.00

Elec. Furnace and Fdry. Grades

11. Billet, Bloom & Forge Crops	+ 7.50
12. Bar Crops & Plate	+ 5.00
13. Cast Steel	+ 5.00
14. Punchings & Plate Scrap	+ 2.50
15. Electric Furnace Bundles	+ 2.00
Cut Structurals & Plate	
16. 3 feet and under	+ 3.00
17. 2 feet and under	+ 5.00
18. 1 foot and under	+ 6.00
19. Briquetted Cast Iron Borings	Base
Foundry, Steel:	
20. 2 feet and under	Base
21. 1 foot and under	+ 2.00
22. Springs and Crankshafts	+ 1.00
23. Alloy Free Turnings	— 2.00
24. Heavy Turnings	— 1.00
25. Briquetted Turnings	Base
26. No. 1 Chemical Borings	— 3.00
27. No. 2 Chemical Borings	— 4.00
28. Wrought Iron	+ 10.00
29. Shafting	+ 10.00
31. Old Tin & Terne Plated Bundles	—10.00

Unprepared Grades

When compressed constitutes:

32. No. 1 Bundles	— 6.00
33. No. 2 Bundles	— 9.00
34. Other than material suitable for hydraulic compression	— 8.00

Restrictions on Use

(1) Prices for Grades 11 and 23 may be charged only when shipped to a consumer directly from an industrial producer; otherwise ceiling prices shall not exceed prices established for Grades 12 and 8, respectively. (2) Prices established for Grades 26 and 27 may be charged only when sold for use for chemical or annealing purposes, and in the case of Grade 27, for briquetting and direct charge into an electric furnace; otherwise ceiling prices shall not exceed price established for Grade 10. (3) Prices established for Grade 28 may be charged only when sold to a producer of wrought iron; otherwise ceiling price shall not exceed ceiling price for corresponding grade of basic open-hearth.

(4) Premiums for Grades 11-18, 20 and 21 may be charged only when sold for use in electric and acid open-hearth furnaces or foundries; or in basic O-H or blast furnace under NPA allocation or OPS authorization.

(5) Prices for Grade 29 may be charged only when sold for forging or rerolling purpose.

Special Pricing Provisions

(1) Sellers of Grades 26 and 27 may make an extra charge of $1.50 per ton for loading in box cars, or 75 cents per ton for covering gondola cars with a weather-resistant covering.

(2) Ceiling price of pit scrap, ladle scrap, salamander scrap, skulls, skimmings or scrap recovered from slag dumps and prepared to charging box size, shall be computed by deducting from the price of No. 1 heavy melting steel of dealer and industrial origin, the following amounts: Where iron content is 85% and over, $6; 75% and over, $10; less than 75%, $12.

(3) Ceiling price of any inferior grade of scrap not listed shall not exceed the price of No. 1 bundles less $15.00.

Differentials from Base

Differentials per gross ton above or below the price of Grade 1 (No. 1 railroad heavy melting steel) for other grades of railroad steel scrap:

2. No. 2 Heavy Melting Steel	—$2.00
3. No. 2 Steel Wheel	Base
4. Hollow Bored Axles and loco. axles with keyways between the wheelseats	Base
5. No. 1 Bushelling	— 3.50
6. No. 1 Turnings	— 3.00
7. No. 2 Turnings, Drillings & Borings	—12.00
8. No. 2 Cast Steel and uncut wheelcenters	— 6.00
9. Uncut Frogs, Switches	Base
10. Flues, Tubes & Pipes	— 8.00
11. Structural, Wrought Iron and/or steel, uncut	— 6.00
12. Destroyed Steel Cars	— 8.00
13. No. 1 Sheet Scrap	— 9.50
14. Scrap Rails, Random Lengths	+ 2.00
15. Rerolling Rails	+ 7.00
Cut Rails:	
16. 3 feet and under	+ 5.00
17. 2 feet and under	+ 6.00
18. 18 inches and under	+ 8.00
19. Cast Steel, No. 1	+ 3.00
20. Uncut Tires	+ 2.00
21. Cut Tires	+ 5.00
Bolsters & Side Frames:	
22. Uncut	Base
23. Cut	+ 3.00
24. Angles, Splice Bars & Tie Plates	+ 5.00
25. Solid Steel Axles	+ 12.00
26. Steel Wheels, No. 3 oversize	Base
27. Steel Wheels, No. 3	+ 5.00
28. Spring Steel	+ 5.00
29. Couplers & Knuckles	+ 5.00
30. Wrought Iron	+ 8.00
31. Fireboxes	— 8.00
32. Boilers	— 6.00
33. No. 2 Sheet Scrap	—13.00
34. Carsides, Doors, Car Ends, cut apart	— 6.00
35. Unassorted Iron & Steel	— 6.00
36. Unprepared scrap, not suitable for hydraulic compression	— 8.00

Restrictions on Use

(1) Price established for Grade 15 may be charged only when purchased and sold for rerolling uses; otherwise, ceiling shall not exceed that for Grade 14.

(2) Price established for Grade 30 may be charged only when sold to a producer of wrought iron; otherwise, ceiling shall not exceed that for No. 1 heavy melting steel.

(3) Price for Grade 25 may be charged only when sold for rerolling and forging purposes; otherwise, ceiling shall not exceed that for base grade (No. 1).

CAST IRON SCRAP

Ceiling price per gross ton for following grades shall be f.o.b. shipping point:

Cast Iron:	
1. No. 1 (Cupola)	$49.00
2. No. 2 (Charging Box)	47.00
3. No. 3 (Hvy. Breakable)	45.00
4. No. 4 (Burnt Cast)	41.00
5. Cast Iron Brake Shoes	41.00
6. Stove Plate	46.00
7. Clean Auto Cast	52.00
8. Unstripped Motor Blocks	43.00
9. Wheels, No. 1	47.00
10. Malleable	55.00
11. Drop Broken Machinery	52.00

Restrictions on Use

(1) Ceiling shipping point price which a basic open-hearth consumer may pay for No. 1 cast iron, clean auto cast, malleable or drop broken machinery cast shall be ceiling price for No. 2 charging box cast.

(2) Ceiling shipping point price which any foundry other than a malleable iron producer may pay for malleable shall be ceiling price for No. 1 cast iron.

Preparation Charges

Ceiling fees per gross ton which may be charged for intransit preparation of any grade of steel scrap of dealer or industrial origin authorized by OPS are:

(1) For preparing into Grades No. 3, No. 4 or No. 2, $8.

(2) For hydraulically compressing Grade No. 1, $6 per ton; Grade No. 5, $8.

(3) For crushing Grade No. 6, $3. For preparing into:

(4) Grade No. 25, $6.

(5) Grade No. 19, $6.

(6) Grades No. 12, No. 13, No. 14, No. 16, or No. 20, $10.

(7) Grade No. 17 or No. 21, $11.

(8) Grade No. 18, $12.

(9) For hydraulically compressing Grade No. 15, $8.

(10) For preparing into Grade No. 28, $10.

Ceiling fees per gross ton which may be charged for intransit preparation of any grade of steel scrap of railroad origin shall be:

(1) For preparing into Grade No. 1 and Grade No. 2, $8.

(2) For hydraulically compressing Grade No. 13, $6.

For preparing into:

(3) Grade No. 16, $4.

(4) Grade No. 17, $5.

(5) Grade No. 18, $7.

(6) Grade No. 21, $4.

(7) Grade No. 23, $4.

Ceiling fees per gross ton which may be charged for intranait preparation of cast iron are limited to:

(1) For preparing Grade No. 8 into grade No. 7, $9.

(2) For preparing Grade No. 3 into Grade No. 11, $7.

(3) For preparing Grade No. 3 into Grade No. 1, $4.

Whenever scrap has arrived at its point of delivery and consumer engages a dealer to prepare such scrap, no fee may be charged for such services unless consumer obtains prior written OPS approval.

Commissions

No commission shall be payable to a broker in excess of $1.

Premium for Alloy Content

No premium may be charged for alloy content except: $1.25 per ton for each 0.25% of nickel where scrap contains not less than 1% and not over 5.25% nickel; $2 per ton for scrap containing not less than 0.15 per cent molybdenum and $3 for scrap containing not less than 0.65% molybdenum; for scrap containing not less than 10% manganese, $4 for scrap in sizes larger than 12 x 24 x 8 in., and $14 for scrap cut in that size or smaller (applicable only if scrap is sold for electric furnace uses or on NPA allocation); $1 for scrap conforming to SAE 52100.

Switching Charges

Switching charges to be deducted from basing point prices of dealer, industrial and nonoperating railroad scrap, to determine ceiling shipping point prices for scrap originating in basing points are per gross ton: Alabama City, Ala., 43c; Ashland, Ky., 47c; Atlanta, 51c. Bethlehem, Pa., 52c; Birmingham, 50c; Brackenridge, Pa. 53c; Buffalo, 83c; Butler, Pa., 65c. Canton, O., 51c; Chicago (including Gary, Ind.), $1.34; Cincinnati (including Newport, Ky.), 65c; Claymont, Del. (including Chester, Pa.), 79c; Cleveland, 76c. Coatesville, Pa., 50c; Conshohocken, Pa., 20c. Detroit, 95c; Duluth, Minn., 50c. Harrisburg, Pa., 51c; Houston, 57c. Johnstown, Pa., 75c. Kansas City, Mo., 75c; Kokomo, Ind., 51c. Middletown, O., 26c; Midland, Pa., 75c; Minnequa, Colo., 33c; Monessen, Pa., 51c. Phoenixville, Pa., 51c; Pittsburg, Calif., 65c; Pittsburgh (including Bessemer, Homestead, Duquesne, Munhall), 99c; Portland, Oreg., 52c; Portsmouth, O., 51c. St. Louis (including Federal, Granite City, E. St. Louis, Madison, Ill.), 51c; San Francisco (including So. San Francisco, Niles, Oakland), 66c; Seattle, 59c; Sharon, Pa., 75c; Sparrows Point, Md., 20c; Steubenville, O., 51c. Warren, Pa., 75c; Weirton, 70c. Youngstown, 75c.

HAMILTON, ONT.

(Delivered Prices)

Heavy Melt	$35.00
No. 1 Bundles	35.00
No. 2 Bundles	35.00
Mechanical Bundles	31.50
Mixed Steel Scrap	31.00
Mixed Borings, Turnings	32.00
Rails, Remelting	35.00
Rails, Rerolling	38.00
Bushelling	29.50
Bushelings new factory:	
Prep'd	33.00
Unprep'd	31.00
Short Steel Turnings	32.00
Cast Iron Grades*	
No. 1 Machinery Cast	50.00

* F.o.b. shipping point.

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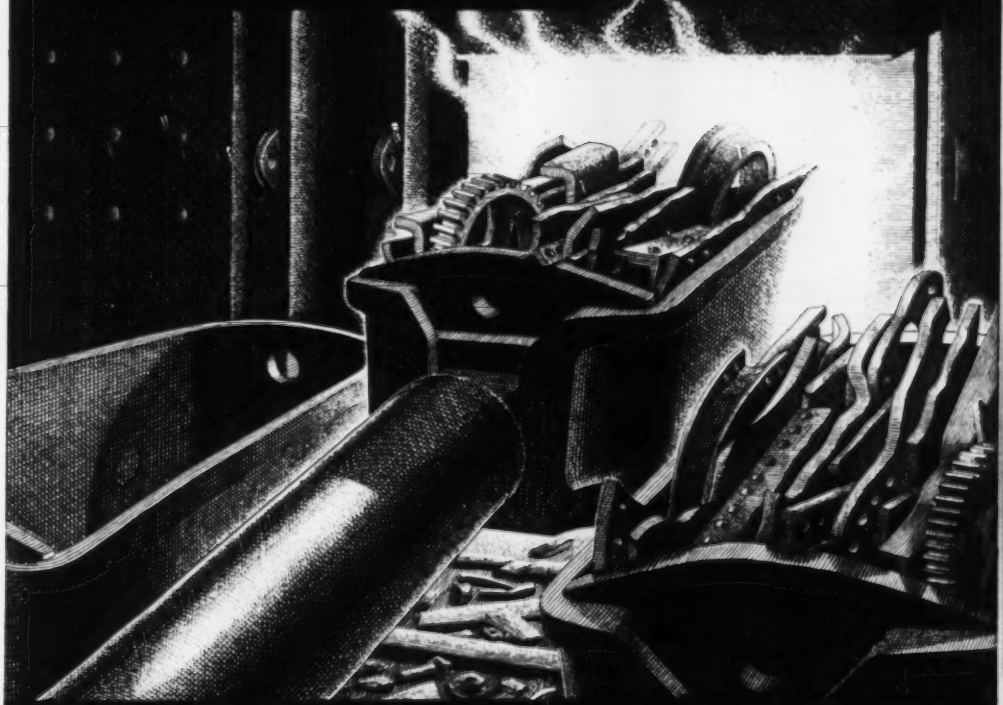

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The Metal Market

Labor fireworks are coming for non-steel producers and fabricators. With the price squeeze on, more subsidies are likely to appear. Modified stockpile plan shapes up

PATTERN of the steel wage procedure may cover far more than just that industry's labor troubles.

All metals producers or fabricators facing wage disputes can expect to be on the defensive throughout contract negotiations. In a mobilization economy the government won't tolerate strikes in vital industries—and its decisions in nearly all disputes will follow the path laid out in the steel case.

Carte Blanche—This doesn't mean that all metals industries can expect seizure. That ultimate action might be utilized to coerce management into strikeless settlements though.

Significant is the consistency of government in siding with unions. Labor leaders are well aware of this election-year backing. Their demands are always a little higher than their expectations; after the Truman carte blanche, they may raise their sights.

Heavy Hand — With brass, aluminum, copper and other industries expecting labor fireworks soon, the wage-price pressure will surely climb. The heavy hand of government will be felt in prices too. The increasing use of subsidy rather than realistic pricing in industry is but another step in the government's assumption of a free market's functions.

The disturbing fact—but one that producers and fabricators alike must face—is the government's taking the reins in both collective bargaining and industry management.

Stockpile Plan—Another inroad on industry's domain by the government is seen in a modified stockpile plan being worked up in Washington. That plan involves setting up of a temporary reserve of metals from tonnages that had been destined for the national stockpile. Civilian goods producers could draw on that temporary reserve for their needs.

This procedure would allow drawing on the metals without delay and red tape encountered in getting materials out of the government stockpile. If no claims for the metal in the temporary reserve were made within a certain period of time, it would automatically be transferred to the permanent stockpile.

The plan might have virtues on its face for metals-starved fabricators. As a practical matter, it could be a means of keeping producers happy without resorting to decontrol. A free market might be difficult to re-establish after such program got underway.

Copper Complexion Clears

Delayed deliveries are still common in copper but NPA, perhaps whistling in the dark, says second quarter orders can probably be filled. Paul B. Andrews of NPA's Copper Division says supplies are healthier because copper and brass scrap returns are overbalancing the shorter supplies of refined copper.

Unless the international picture darkens, says Mr. Andrews, the current easing could mark the beginning of the end of the copper shortage.

Increased availability of scrap to producers of copper controlled materials such as brass mills, ingot makers and foundries are attributed by NPA to:

Steady increase in scrap offerings since last November because of softening foreign markets and anticipation of a similar easing in this country.

Success of collections from fabricators of ammunition and other military products by the Defense Department.

Return of increasing amount of old scrap by the military.

Tonnages gleaned in other salvage programs.

Industry officials say that brass scrap volume is showing betterment, but increases in the copper returns are so small as to be of little significance to smelters.

Zinc Buyers Cautious

Slow movement of special high grade zinc for April delivery keeps zinc buyers cautious, though prime western's relative scarcity bolsters the metal's price. Surplus smelter stocks are expected to be found at month-end. Further stockpiling by General Services Administration is likely unless the die casters' business shows more life.

Because of the loss of most of last week's steel production, galvanizers' needs will ease slightly, giving prime western a nudge toward normalcy. Meeting with NPA Zinc Division officials in Washington last week, the industry advisory committee sought anew to impress the government men with the desirability of removing distribution and use controls soon.

Only Washington activity on zinc of late has been a revision of scrap price orders on sales made by the government. It may serve only to harass the industry further. Zinc (and battery lead) scrap prices are now to be computed at point of shipment; the general industry practice is to figure prices delivered. The change was made to conform to GSA requirements.

Lead Orders Holding Up

Perking up of the lead market is noticeable, but buying is for current needs rather than inventory. Orders booked for April shipment are holding up well, say producers. Lead buyers still look for a price drop of minor proportions before the year is out. Lead is generally classed in an easier category than zinc and would probably be one of the first metals decontrolled.

Individual Inventories

Balanced inventories in brass mill, wire mill and foundry industries are the next objective of NPA's Copper Division. April allocations of refined copper to brass mills were boosted, and wire mill allocations reduced. Foundries and ingot makers also have had some adjustments.

Working inventories will henceforth be based on working needs of individual mills and foundries, rather than the limitations uniformly applied by M-16. At the same time, restrictions on scrap allocations to ingot makers and foundries will be tightened to prevent accumulation of unused scrap and use of unauthorized amounts or grades.

Manganese Ore Guaranteed

A $3.8 million loan and a market guarantee from DMPA will bring forth about 264,000 long tons of processed manganese ore by 1959. The contract is with Westmoreland Manganese Corp. for surface mining the ore near Cushman, Ark. The new plant is expected to begin operations in about eight months.

NONFERROUS METALS

(Cents per pound, carlots, except as otherwise noted)

Primary Metals

Copper: Electrolytic 24.50c, Conn. Valley, Lake 24.62½c, delivered.

Brass Ingots: 85-5-5-5 (No. 115) 27.25c, 88-10-2 (No. 215) 40.00c; 80-10-10 (No. 305) 33.00c; No. 1 yellow (No. 405) 23.25c.

Zinc: Prime western 19.50c; brass special 19.75c; intermediate 20.00c, East St. Louis; high grade 20.85c, delivered.

Lead: Common 18.80c; chemical 18.90c; corroding 18.90c, St. Louis.

Primary Aluminum: 99% plus, ingots 19.00c, pigs 18.00c. Base prices for 10,000 lb and over. Freight allowed on 500 lb or more but not in excess of rate applicable on 30,000 lb c.l. orders.

Secondary Aluminum: Piston alloys 20.50c; No. 12 foundry alloy (No. 2 grade) 19.50c; steel deoxidizing grades, notch bars, granulated or shot, Grade 1, 18.80c; grade 2, 18.60c; grade 3, 18.40c; grade 4, 18.20c.

Magnesium: Commercially pure (99.8%) standard ingots, 10,000 lb and over 24.50c, f.o.b. Freeport, Tex.

Tin: Grade A, prompt 121.50c.

Antimony: American 99-99.8% and over but not meeting specifications below 50.00c; 99.8% and over (arsenic 0.05% max., other impurities 0.1% max.) 50.50c; f.o.b. Laredo, Tex., for bulk shipments.

Nickel: Electrolytic cathodes, 99.9%, base sizes at refinery, unpacked, 56.50c; 25-lb pigs 59.15c; "XX" nickel shot, 60.15c; "F" nickel shot or ingots, for addition to cast iron, 56.50c. Prices include import duty.

Mercury: Open market, spot, New York, $207-$210 per 76-lb flask.

Beryllium-Copper: 3.75-4.25% Be, $1.56 per lb of alloy, f.o.b. Reading, Pa.

Cadmium: "Regular" straight or flat forms, $3.85 del.; special or patented shapes $2.80.

Cobalt: 97.99%, $2.40 per lb for 500 lb (kegs); $2.42 per lb for 100 lb (case); $2.47 per lb under 100 lb.

Gold: U. S. Treasury, $35 per ounce.

Silver: Open market, New York 88.00c per oz.

Platinum: $90-$93 per ounce from refineries.

Palladium: $24 per troy ounce.

Iridium: $200 per troy ounce.

Titanium (sponge form): $5 per pound.

Rolled, Drawn, Extruded Products

COPPER AND BRASS

(Ceiling prices, cents per pound, f.o.b. mill, effective Aug. 23, 1951)

Sheet: Copper 41.68; yellow brass 38.28; commercial bronze, 95% 41.61; 90% 41.13; red brass, 85% 40.14; 80% 39.67; best quality, 39.15; nickel silver, 18% 53.14; phosphor-bronze grade A, 5% 61.07.

Rod: Copper, hot-rolled 37.53, cold-drawn 38.78; yellow brass free cutting, 32.63; commercial bronze 95% 41.30; 90% 40.82; red brass 85% 39.83; 80% 39.36.

Seamless Tubing: Copper 41.72; yellow brass 41.39; commercial bronze, 90% 43.79; red brass, 85% 43.06.

Wire: Yellow brass 38.57; commercial bronze, 95% 41.90; 90% 41.42; red brass, 85% 40.43; 80% 39.96; best quality brass, 39.44.

(Base prices, effective Dec. 26, 1951)

Copper Wire: Bare, soft, f.o.b. eastern mills, 100,000 lb lots, 28.845; 30,000 lb lots, 28.67; l.c.l., 29.17. Weatherproof, 100,000 lb, 30.35; 30,000 lb, 30.40; l.c.l., 31.10. Magnet wire del., 18,000 lb or more, 34.50; l.c.l., 35.25.

ALUMINUM

(30,000 lb base, freight allowed on 500 lb or more, but not in excess of rate applicable on 30,000 lb c.l. orders)

Sheets and Circles: 2s and 3s mill finish c.l.

Thickness Range Inches	Widths or Diameters, In., Inc.	Flat Sheet Base*	Coiled Sheet Base	Coiled Sheet Circle† Base
0.249-0.136	12-48	30.1	...	...
0.135-0.096	12-48	30.6	...	...
0.095-0.077	12-48	31.2	29.1	33.2
0.076-0.061	12-48	31.8	29.3	33.4
0.060-0.048	12-48	32.1	29.5	33.7
0.047-0.038	12-48	32.5	29.8	34.0
0.037-0.030	12-48	32.9	30.2	34.6
0.029-0.024	12-48	33.4	30.8	35.0
0.023-0.019	12-36	34.0	31.1	35.7
0.018-0.017	12-36	34.7	31.7	36.6
0.016-0.015	12-36	35.5	32.4	37.6
0.014	12-24	36.5	33.3	38.9
0.013-0.012	12-24	37.4	34.0	39.7
0.011	12-24	38.4	35.0	41.2
0.010-0.0095	12-24	39.4	36.1	42.7
0.009-0.0085	12-24	40.6	37.2	44.4
0.008-0.0075	12-24	41.9	38.4	46.1
0.007	12-18	43.3	39.7	48.2
0.006	12-18	44.8	41.0	52.8

* Lengths 72 to 180 inches. † Maximum diameter, 26 inches.

Screw Machine Stock: 5000 lb and over.

Dia. (in.) or distance across flats	Round— R317-T4	R-317-T4	Hexagonal— 17S-T4
0.125	52.0	...	...
0.156-0.0188	44.0	...	...
0.219-0.313	41.5	...	...
0.375	40.0	46.0	48.0
0.406	40.0	...	...
0.438	40.0	46.0	48.0
0.469	40.0	...	...
0.500	40.0	46.0	48.0
0.531	40.0	...	...
0.563	40.0	...	45.0
0.594	40.0	...	...
0.625	40.0	43.5	45.0
0.688	40.0	...	45.0
0.750-1.000	39.0	41.0	42.5
1.063	39.0	...	41.0
1.125-1.500	37.5	39.5	41.0
1.563	37.0	...	...
1.625	36.5	...	39.5
1.688-2.000	36.5	...	...

LEAD

(Prices to jobbers f.o.b. Buffalo, Cleveland, Pittsburgh) Sheets: Full rolls, 140 sq ft or more $24.00 per cwt; add 50c cwt 10 sq ft to 140 sq ft. Pipe: Full coils $24.00 per cwt. Traps and bends: List prices plus 65%.

ZINC

Sheets 26.50c, f.o.b. mill 36,000 lb and over. Ribbon zinc in coils, 25.00c, f.o.b. mill, 36,000 lb and over. Plates, hot rolled 12-in., 25.50-26.50c; over 12-in., 25.50-26.50c.

"A" NICKEL

(Base prices f.o.b. mill)

Sheets, cold-rolled, 77.00c. Strip, cold-rolled, 83.00c. Rods and shapes, 73.00c. Plates, 75.00c. Seamless tubes, 106.00c.

MONEL

(Base prices f.o.b. mill)

Sheets, cold-rolled 60.50c. Strip, cold-rolled 63.50c. Rods and shapes, 58.50c. Plates, 59.50c. Seamless tubes, 93.50c. Shot and blocks, 53.50c.

MAGNESIUM

Extruded Rounds 12 in. long, 1.31 in. in diameter, less than 25 lb, 55.00-62.00c; 25 to 99 lb, 45.00-52.00c; 100 lb to 5000 lb, 41.00c.

TITANIUM

(Prices per lb 10,000 lb and over, f.o.b. mill) Sheets, $15; sheared mill plate, $12; strip, $15; wire, $10; forgings, $6; hot-rolled and forged bars, $6.

DAILY PRICE RECORD

1951	Copper	Lead	Zinc	Tin	Aluminum	Antimony	Nickel	Silver
Apr. 1-10	24.50	18.80	19.50	121.50	19.00	50.00	56.50	88.00
Mar. 1-31	24.50	18.80	19.50	121.50	19.00	50.00	56.50	88.00
Mar. Avg.	24.50	18.80	19.50	121.50	19.00	50.00	56.50	88.00
Feb. Avg.	24.50	18.80	19.50	121.50	19.00	50.00	56.50	88.00
Jan. Avg.	24.50	18.80	19.50	109.404	19.00	50.00	56.50	88.00
1951								
Dec. Avg.	24.50	18.80	19.50	103.00	19.00	50.00	56.50	88.00
Nov. Avg.	24.50	18.80	19.50	103.00	19.00	44.56	56.50	88.00
Oct. Avg.	24.50	18.726	19.426	103.00	19.00	42.00	56.50	88.12
Sept. Avg.	24.50	18.80	17.50	103.00	19.00	42.00	56.50	90.16
Aug. Avg.	24.50	18.80	17.50	103.00	19.00	42.00	56.50	90.16
July Avg.	24.50	18.80	17.50	108.00	19.00	42.00	56.50	90.16

NOTE: Copper: Electrolytic del. Conn. Valley; Lead, common grade, del. St. Louis; Zinc, prime western, E. St. Louis; Tin, Straits, del. New York; Aluminum primary ingots, 99% del; Antimony, bulk, f.o.b. Laredo, Tex.; Nickel, electrolytic cathodes, 99.9%, base sizes at refinery unpacked. Silver, open market, New York. Prices, cents per pound; except silver, cents per ounce.

Plating Materials

Chromic Acid: 99.9% flakes, f.o.b. Philadelphia, carloads, 23.00c; 5 tons and over 23.50c; 1 to 5 tons, 29.00c; less than 1 ton 29.50c.

Copper Anodes: Base 2000 to 5000 lb; f.o.b. shipping point, freight allowed: Flat, rolled, 38.34c; oval 37.84c.

Nickel Anodes: Rolled oval, carbonized, carloads, 74.50c; 10,000 to 20,000 lb, 75.50c; 3000 to 10,000 lb, 76.50c; 500 to 3000 lb 77.50c; 100 to 500 lb, 79.50c; under 100 lb, 82.50c; f.o.b. Cleveland.

Nickel Chloride: 36.50c in 100 lb bags; 34.50c in lots of 400 lb through 10,000 lb; 34.00c over 10,000 lb, f.o.b. Cleveland, freight allowed on 400 lb or more.

Sodium Stannate: 25 lb cans only, less than 100 lb. to consumers 68.7c; 100 or 350 lb drums only, 100 to 600 lb 71.60c; 700 to 1900 lb, 69c; 2000 to 9900 lb, 67.3c. Freight allowed east of Mississippi and north of Ohio and Potomac rivers.

Tin Anodes: Bar, 1000 lb and over, $1.375; 500 to 999 lb, $1.38; 200 to 499 lb, $1.385; less than 200 lb, $1.40. Freight allowed east of Mississippi and north of Ohio and Potomac.

Zinc Cyanide: 100 lb drums, less than 10 drums 54.30c, 10 or more drums, 52.30c, f.o.b. Niagara Falls, N. Y.

Stannous Sulphate: 100 lb kegs or 400 lb bbl, less than 2000 lb $1.11; more than 2000 lb, $1.09. Freight allowed east of Mississippi and north of Ohio and Potomac rivers.

Stannous Chloride (Anhydrous): In 400 lb bbl, 98.5c; 100 lb kegs 99.5c. Freight allowed.

Scrap Metals

Brass Mill Allowances

Ceiling prices in cents per pound for less than 20,000 lb, f.o.b. shipping point, effective June 26, 1951.

	Clean Heavy	Rod Ends	Clean Turnings
Copper	21.50	21.50	20.75
Yellow Brass	19.125	18.875	17.875
Commercial Bronze			
95%	20.50	20.25	19.75
90%	20.50	20.25	19.75
Red Brass			
85%	20.25	20.00	19.375
80%	20.125	19.875	19.375
Muntz metal	18.125	17.875	17.375
Nickel silver, 10%	21.50	21.25	10.75
Phos. Bronze, 5%	25.25	25.00	24.00

Copper Scrap Ceiling Prices

(Base prices, cents per pound, less than 40,000 lb f.o.b. point of shipment)

Group 1: No. 1 copper 19.25; No. 2 copper wire and mixed heavy 17.75; light copper 16.50; No. 1 borings 19.25; No. 2 borings 17.75; refinery brass, 17.00 per lb of dry Cu content for 50 to 60 per cent material and 17.25 per lb for over 60 per cent material. Group II: No. 1 soft red brass solids 18.50; No. 1 composition borings 19.25 per lb of Cu content plus 63 cents per lb of tin content; mixed brass borings 19.25 per pound of Cu content plus 60 cents per lb of tin content; unlined red car boxes 18.25; lined red car boxes 17.25; cocks and faucets 16.00; mixed brass screens 16.00; zincy bronze solids and borings 16.25.

Zinc Scrap Ceiling Prices

(Cents per pound, f.o.b. point of shipment) Unsweated zinc dross, 13.75c; new clippings and trimmings, 15.50c; engravers' and lithographers' plates, 15.50c; die cast slabs, min. 90% zinc, 13.75c; old zinc scrap, 12.25c; forming and stamping dies, 12.25c; new die cast scrap, 11.75c; old zinc die cast radiator grille, 11.50c; old die cast scrap, 10.50c.

Lead Scrap Ceiling Prices

(F.o.b. point of shipment)

Battery lead plates, 19.00c per lb of lead and antimony content, less smelting charge of 2 cents per lb of material in lots 15,000 lb or more; less 2.25c in lots less than 15,000 lb, or a flat price of 11.25c a pound of battery plates. Used storage batteries (in boxes) drained of liquid, 7.65c for 15,000 lb or more; 7.45c for less than 15,000 lb. Soft lead scrap, hard lead scrap, battery slugs, cable lead scrap or lead content of lead-covered cable scrap, 17.25c in lots of 20,000 lb or more; 16.50c in lots under 20,000 lb.

Aluminum Scrap Ceiling Prices

(Cents per pound, f.o.b. point of shipment, less than 5000 lb)

Segregated plant scrap: 2s solids, copper free, 10.50; high grade borings and turnings, 8.50; No. 12 piston borings and turnings, 7.50; Mixed plant scrap; Copper-free solids, 10.00; dural type, 9.00. Obsolete scrap: Pure old cable, 10.00; sheet and sheet utensils, 7.25; old castings and forgings, 7.75; clean pistons, free of struts, 7.75; pistons with struts, 5.75.

Sheets, Strip . . .

Sheet and Strip Prices, Pages 174 & 175

Cleveland — Extent of lost sheet production as result of last week's labor disturbance will depend upon the speed with which the rolling mills get back into operation. Where the bank of semifinished steel permitted, rolling was resumed fairly quickly after the government seized the plants. The loss of semifininshed output due to shutdown of blast furnaces and steelworks, however, will be felt by the finishing mills for some time.

New bookings were limited last week with the major producers declining to commit themselves in the face of the threatened work stoppage. The larger mills are accepting orders only through July and have little tonnage to offer for that month. The strike threat spurred demand to some extent but the mills could not accept additional tonnage. Recent improvement in requirements from the automotive and appliance manufacturers still is in evidence.

Boston— Sheet and strip consumers are not crowding to place third quarter orders. There are still openings in second quarter schedules for cold-rolled strip. Flat-rolled users have completed inventory adjustments. There has been a decline in order revisions covering volume over the next three months.

Philadelphia—Following sharp curtailment in operations because of complications arising from the labor dispute, indications point to early betterment in sheet business. Consumers stand little chance of getting much more tonnage for delivery in the current period than they have already placed, but undoubtedly will find mills in position to accept third quarter needs.

Pittsburgh—District mills note no change in buying sentiment due to relaxed production controls on durable goods. Producers, however, see no difficulty in filling third quarter schedules with the exception of electrical silicon steels. Current demand for galvanized sheets is strong and will remain so into fourth quarter. Strip and long ternes are in tight supply with cold-rolled much easier by comparison.

Correct Pricing Discrepancy

Washington — Manufacturers of galvanized products subject to the General Ceiling Price Regulation, last week were permitted by OPS to adjust ceiling prices to reflect increased cost of zinc. Manufacturers affected are those not parties to the voluntary agreement with ESA under which most major producers on Oct. 2, 1951, were permitted to increase their ceilings to reflect higher zinc costs.

The action taken last week by OPS corrects the discrepancy between those parties to the agreement and those not parties to it. Manufacturers subject to GCPR now may adjust ceilings in accordance with price lists by using a price of 19.50 cents per pound for zinc, or by adjusting ceilings to reflect an increase of 2 cents per pound on zinc. The action is covered by amendment 1 to supplementary

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regulation 76 under GCPR, effective Apr. 14.

Tubular Goods . . .

Tubular Goods Prices, Page 177

St. Louis—Pipe production here was unaffected by the steel labor trouble last week because Laclede Steel"s labor contract does not ex-expire until late summer. Pipe demand here is unabated. Second quarter order books are filled and third quarter books are expected to be sold out.

Steel Bars . . .

Bar Prices, Page 173

Boston—Bar requirements for military production are higher than for other steel products and the ratio is mounting. Additional contracts for fuzes have been placed with district shops, including Independent Lock Co., Fitchburg, Mass. Consumers of bars, notably larger sizes, have no sizable inventory. Bolt shops, in some cases, have fair bar stocks, but are short of nut material. Heaviest users, forge shops, have a high volume of military work.

Pittsburgh—Defense requirements are sustaining high demand for bars. Mills see continued strong demand through thrid and fourth quarters. While all sizes and types of bars are extremely tight here, the forging grades larger than 1½ in. are hardest to pick up. Most all space in July production schedules has been taken up by consumers.

Cleveland—Some bar production was lost last week because of the labor disturbance in the industry. While the shutdown in operations was shortlived, the lost production will not be made up quickly because of the loss in semifinished output due to the closing down of open-hearths and blast furnaces. The bar shortage, consequently, will be intensified over coming weeks.

Structural Shapes . . .

Structural Shape Prices, Page 173

New York—Some fabricators planned to close down to conserve inventories when a steel strike appeared inevitable. Other shops, however, scheduled full operations. An outstanding award involves 5000 tons for an office building for the 260 Madison Avenue Corp., this city.

Irving Subway Grating Co., Long Island City, booked its second major steel grating contract for generating stations which will supply power for the Atomic Energy Commission's Paducah, Ky., plant. The contract, awarded through the Elizabeth Iron Works, Elizabeth, N. J., is for the Kevil, Ky., station. Grating deliveries begin May 1.

Boston—On the bulk of carbon fabricated structural steel in place, Bethlehem Steel Co., is low on contract C-2c bidding 22.21c per pound and 27.10c on silicon steel. This contract takes a total of 3600 tons, superstructure, Fitzgerald expressway, Boston. Remaining contracts to be bid for this project, all direct on steel, require 27,000 tons. Vermont is placing bridge requirements direct to fab-

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Cleveland—Structural fabricators anticipate a steady pickup in order volume with building restrictions relaxed. Extent to which structural supplies will be adversely affected by the labor difficulty in the steel industry last week is unknown, but it generally is believed the lost production will not be too great. An encouraging development in the market was settlement last week of the 9-day strike of structural iron workers in the area.

Birmingham — Shape demand is more active than it has been in recent months. Considerable business is in the prospective stage with quite a few sizable jobs marking time.

Seattle—Fabricators hold substantial order backlogs but work is being sought for the last half of the year. Some tonnages for Alaska military installations and public works in the Pacific Northwest are expected to be been placed.

Tin Plate . . .

Tin Plate Prices, Page 174

Pittsburgh—Tin plate inventories of canmakers are in shape to support operations for five to six weeks. Weirton Steel Co. is the only tin plate producer in this district that was not affected by the threatened strike.

Plates . . .

Plate Prices, Page 173

Washington—Placing and acceptance of orders for production of lightgage plates on wide plate mills is limited by NPA directive 5 to M-1, effective July 1. Continued strong demand for sheared mill plate motivated the regulation designed to conserve productive capacity of 160-in. and larger mills for defense and defense-supporting requirements. Approximately 50,000 to 70,000 tons of heavy plates per quarter will be conserved by the regulation.

Increased availability of tonnage from smaller sheared and wide strip mills, it is said, should more than offset any displaced tonnage in the lighter gages. The only definite effect on normal operations will be the probable necessity of some redesign through welding by some consumers who have avoided such through the purchase of wider and larger plates.

The new limitation applies only to carbon steels. It does not apply to stainless, full alloy, plates for pipe, armor plate, circles for heads, or finished conversion plate products.

Boston—Small tank fabricating shops generally have the largest inventories in months, but they still are under 45 days. Most also have heads to balance plate stocks. Weldment shops and others using heavier plates are not as well situated. Starting July 1, limit on orders for lightgage carbon plates to be produced on wide mills, 160-in. and larger, becomes operative. This is expected to open capacity for at least 50,000 tons of heavier plates per quarter.

New York — The smaller eastern plate mills were operating full time as last week drew to a close. Two mills, one at Conshohocken, Pa., and the other at Harrisburg, Pa., were

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not affected by the labor trouble. The mills at Claymont, Del., and Coatesville, Pa., resumed production after less than one day's disruption.

Philadelphia — Government order restricting the rolling of plates ¾-in. and lighter to less than 160-in. mills applies not only to carbon steel but also to low alloy high strength steel plates. The order does not include high alloy or stainless plates, plate for pipe, or plate circles for flanged or dished heads. Nor does it apply to finished conversion steel plate.

Pittsburgh — Mills' third quarter books have been filling rapidly. NPA's recent order banning production of light plate on 160-in. and larger mills effective July 1, 1952, will take away some of the district's production.

Birmingham — Plate production has held at virtual capacity in this district for many months. But there is need for additional tonnage in view of tank output, carbuilding, shipbuilding on the Gulf and miscellaneous requirements.

Seattle — Pulp mill expansion, oil tanks and other private jobs involve considerable plate tonnage. Government projects also are calling for heavy allotments. Plate fabricators are busy.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 173

Boston — Concrete reinforcing bar order backlogs are heavier with distributors reluctant to take on substantial additional tonnage unless bars are wanted late this year or in early 1953. Considerable volume is in this category, including several thousand tons for the Fitzgerald expressway, Boston. Most of this work is for decks and bars will not be needed until superstructures are ready.

Los Angeles — With relaxation of building controls fabricators look for reinforcing steel demand to be the greatest experienced in the last six months. Scheduled to start by July is a $45 million, 4000-home construction project at Fontana, Calif., near the Kaiser Steel Corp. mill.

Seattle — Award of 4000 tons to Steel Constructors, Portland, Oreg., for the Albeni Falls dam project is the largest recent placement. Pending are 16,500 tons for Chief Joseph dam, general contract for which has been placed.

Rails, Cars . . .

Track Material Prices, Page 173

Birmingham — Southern Railway System tentatively placed an order with the Bessemer plant of Pullman-Standard Car Co. for 1500 gondolas. The order is part of requirements for 3250 open top cars tentatively placed by the railroad at a cost of about $20,500,000.

Wire . . .

Wire Prices, Page 173

Boston — Demand for wire products is improving in spots. There are openings for second quarter in numerous items and most finishing departments are operating below capacity. Third quarter bookings are light and include for the most part

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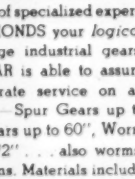

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fixed monthly requirements connected with defense production. Heading stock demand has leveled off after some deferments and cancellations for inventory adjustment. Orders are geared to estimated requirements.

Birmingham—Most wire items are in relatively good supply and there are indications of a relaxation in demand.

Semifinished Steel . . .

Semifinished Prices, Page 173

Pittsburgh — Steelmaking operations in this district fell to rock-bottom due to the threatened strike last week. Only major producer maintaining full production was Weirton Steel Co., Weirton, W. Va. which operates under an independent workers union agreement.

Cleveland — Republic Steel Corp. produced at record-breaking pace in March. The company's eight basic steel plants produced 851,226 tons, topping the previous monthly record of 822,581 in March, 1951. Openhearth production hit a new monthly high of 678,591 tons. Individual plant records were set in Youngstown, Cleveland and Chicago.

Pig Iron . . .

Pig Iron Prices, Page 172

Cleveland — Pig iron production was curtailed sharply here last week as the furnaces were banked because of the steel labor trouble. Several days' production was lost. There are nine local stacks. One of them has been down a couple weeks for repairs. The loss in production will serve to tighten merchant supplies but with foundry demand lagging this is not viewed too gloomily. The easier situation in pig iron, developing the past several months, is reflected in the recent action of NPA upping inventory limitations from 30 to 60 days.

Detroit—Scare buying was absent from pig iron demand last week most foundries apparently holding as much iron as they care to stock. Permission to carry larger inventory did not stimulate ordering.

Boston — Pending resumption of normal supply from Mystic blast furnace about May 15, consumers of No. 2 foundry and malleable pig iron expect to patch out requirements. Outlook for additional iron from Buffalo is dim and some adjustments in analyses of silicon, phosphorus and manganese may be necessary. There is also the possibility of higher scrap melt with cast grades plentiful.

Inventory control limit on pig iron has been raised to 60 days. Also on rough and semifinished gray iron and malleable castings.

Pittsburgh—Despite the calling off of the scheduled steel strike following seizure of the plants by the government, substantial pig iron tonnage will be lost in this area since all of the stacks had been shut down prior to the strike deadline except the three Weirton Steel Co. furnaces at Weirton, W. Va. Weirton employees' independent union is not affiliated with the CIO-United Steelworkers.

Philadelphia — One effect of last week's labor disturbance in the steel industry was general suspension by producers of shipments of pig iron,

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scrap and other raw materials. Exceptions in this district were two steel companies which had reached agreements with the CIO union and, consequently, were able to maintain operations uninterruptedly.

Furnaces banked because of the strike threat are expected to get back into operation soon. Loss of iron at stacks forced to suspend production will be felt for some little time.

St. Louis—Granite City Steel Co.'s blast furnaces continued in operation despite the strike threat in the steel industry. These are manned by AFL union men.

Birmingham—Merchant iron sellers have had considerable pressure taken off them in recent weeks. Pig iron supply, however, is hardly more than sufficient to take care of regular regional needs.

Scrap . . .

Scrap Prices, Page 180

Pittsburgh—Some district mills have been attempting to stockpile scrap at locations apart from their facilities in anticipation of a strike. Material is getting closer inspection by consumers and upgrading seems a thing of the past. There still is a shortage of high quality open-hearth material in western Pennsylvania. Shading of the price on No. 1 cupola cast of $45 to $46 a ton by freight concessions is noted here.

Cleveland—Large tonnages of scrap accumulated on track and in dealers' yards during the period of labor disturbance in the steel industry last week. Beginning several days prior to the scheduled strike deadline the mills began holding up shipments. However, immediately upon resumption of operations following seizure of the plants by the government, releases began coming to brokers and dealers. Expectations are it will be a week or two before accumulations are cleaned up during which period the market may develop an easier tone. For the most part, however, such easiness, it is believed, will be temporary with good quality steelmaking scrap still scarce and all indications pointing to heavy steel mill requirements through the summer. The cast grades are moving sluggishly, and reports of price shading persist with not much change in foundry requirements noted.

Boston—Steel scrap supply improves gradually and consumers are increasingly selective as to quality. Volume of industrial steel grades appearing in the open market is limited. Production is off and tonnage is frequently diverted back to the steel supplier. Yards have more collected tonnage to process, but strictly high grade heavy melting scrap is limited. Cast grades move slowly with consumers holding substantial inventories. Prices are on the soft side with No. 1 cupola cast selling down to $46, shipping point.

New York—Scrap brokers here received word from some of the small eastern steel mills to resume shipments following seizure of the industry's plants by the government and the calling off of the strike by the CIO union. The ban on shipments was put into effect early last week.

Detroit—Mill demand slowed in the days immediately preceding the steel strike deadline but by Wednesday brokers were routing cars to the mills. Goal of some interests is reported to be establishment of 30 days' stocks. Cast grades failed to firm up any on the possibility of a pig iron shortage. Most grades are obtainable at $2 to $5 below ceiling. Some good cupola cast still commands the ceiling.

Chicago—Scrap continued to move to mills not affected by the labor trouble, namely, Wisconsin Steel, Continental Steel, Keystone Steel & Wire and Laclede Steel, but only from regular suppliers. Some mills embargoed shipments. For the present the producer material will remain in cars on track under demurrage charges. Cast scrap remains stagnant with most gray iron foundries operating below capacity.

St. Louis—Heavy holdup orders in anticipation of a steel strike hit local dealers from consumers outside this district. Only one major local user cancelled shipments. Mill scrap piles generally are near 30 days, best in many months. For two weeks the strike threat has been backing up scrap in yards. The cast market remains dead.

Los Angeles—Cast scrap prices have fallen to levels $15 below prices of six months ago. There is virtually no market for foundry grades.

San Francisco—Mills cut down on their acceptances of scrap shipments when the strike threat reached its height. Foundry demand for cast iron grades continues slow. Dealers report selling some No. 1 cupola cast at $42 a ton, but admit the market is weak at that level.

Seattle—Weather conditions are favorable for scrap collection. Mill receipts of steel grades are ample and inventories are described as comfortable. Bethlehem Pacific Coast Steel Corp. is scrapping a large steamer here. This is expected to yield 10,000 tons. The company is out of the cast iron market and is not purchasing bundles at present. Foundries are declining offers of cast grades at $8 to $10 per ton below ceiling prices. The current range on cast scrap is $35 to $40.

Warehouse . . .

Warehouse Prices, Page 179

Chicago—Most warehouses here were unaffected by the steel labor trouble. Order volume showed some increase as consumers attempted to obtain requirements which would not be forthcoming from normal sources. Such tonnages are not large and normal warehouse servicing was given within the limits of the NPA freeze order.

Boston—Freeze of warehouse steel stocks slowed volume with distributors. Flat-rolled inventories are heavier and better balanced. Although still short of galvanized products, better shipments are promised by mills. Heavier sizes in bars and plates are needed, but on the whole distributors have more tonnage to sell.

Philadelphia—Warehouses moved

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Makers of Hand and Power Hack Saw Blades, Frames, Metal Cutting Band Saw Blades and Clemson Lawn Machines

1081A

cautiously last week, discouraging efforts by buyers to purchase more than their immediate requirements. Adding to this restriction was the government freeze order affecting purchases for consumer durable goods and for export. This order originally was designed to affect mill purchases as well but was later revised as it was realized that by the time the regulation was decided upon in Washington the mills were already closing down their operations and, therefore, were not in position to make shipments.

Pittsburgh — District warehouses operating under government orders cut off shipments for civilian end-uses. Material in their inventories will be for high priority military, atomic and machine tool programs. NPA advises that after withdrawal of the necessary and suitable steels for defense production, the freeze will be lifted and normal shipments will be allowed to manufacturers. Warehouses for the time being cannot honor orders from consumer durable producers that carry a priority designation of "V". Also banned are orders for steel products that are for export.

Cleveland — Resumption of steel mill operations following seizure of the plants by the government removed the threat of severe demand pressure on the warehouses, which had been expected from consumers likely to be affected by any choking off of mill shipments. The freeze of warehouse stocks, direction 10 to CMP 1, banning shipments to manufacturers of civilian type items and for export, continued in effect after the mills reopened. Indications are the distributors will adhere to the regulation until it is rescinded by the government. The ban, aimed at conserving steel for defense production, applies to all orders or shipments to be used in products having a CMP symbol containing the letter "V". This letter and a numeral are assigned as allotment symbol for controlled materials used in the production of consumer durable goods.

Detroit — Customer ordering was hectic immediately preceding the steel strike deadline, and warehousemen said they were selling carefully to prevent stock depletion.

San Francisco—Uncertainty due to the threatened steel strike did not affect distributors' sales volume the last few weeks. Activity was in line with recent experience.

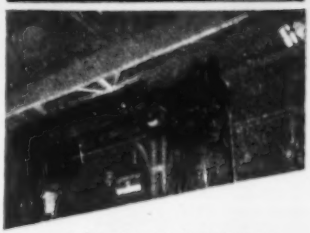
Seattle—April order volume will be above that for March, and continued improvement is expected as the season advances. Hot-rolled sheets and plates are bottlenecks.

Iron Ore . . .

Iron Ore Prices, Page 179

Cleveland—Bad ice conditions on the upper lakes continue to make for a slow opening of the 1952 navigation season. Traffic is picking up steadily though with ore vessels having little difficulty entering and leaving the Escanaba docks. Last midweek the Davis and Sabin locks at the Soo were operating, and expectations were that the MacArthur lock would likely be opened to traffic over the weekend.

Modern Handling System *Reduces* MACHINE DOWNTIME



● To minimize downtime on a milling machine, finished flat stock had to be lifted out of the way quickly and easily. The customer, a prominent steel company, called in a Reading Engineer. A custom-built Hoist and Crane, with an extra long lift and push button control of *all* motions, was engineered and installed. Now handling of finished stock is no longer a "time-waster."

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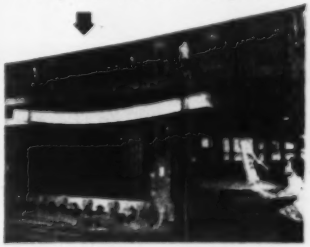

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OVERHEAD TRAVELING CRANES

READING CRANES

PLATES . . .

PLATES PLACED

100 t fr, including shapes, replacement storage tanks for Union Oil Co., Seattle, to Chicago Bridge & Iron Co., Seattle.

100 tons plus, steel tube linings, subcontract on Ross powerhouse, Seattle, Skagit power project, to Todd Shipyards Inc., Seattle. $1,200,000.

PLATES PENDING

200 tons, estimated, two steel dump barges, 100 tons and 1000 cubic yards respectively, and one all-steel oil barge, 1920-barrel capacity; bids June 3, Panama Canal Co., Washington.

110 tons, 250,000-gal. elevated steel water tank, Air Force base, Altus, Okla.; bids Apr. 5, Corps of Engineers, Tulsa, Okla.

100 tons, 20,000-barrel storage tank, Tacoma steam plant No. 2, Consolidated Western Steel Corp., Seattle; low $10,445.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

4000 tons, office building, 200 Madison Avenue Corp., New York, through Heggeman-Harris Co., contractor, to Bethlehem Steel Co., Bethlehem, Pa.

500 tons, Albeni Falls power project, to unstated Portland, Oreg., fabricator.

100 tons or more, capacitator rack equipment, to Gonderman Bros. Engineering Corp., Portland, Oreg., by Bonneville Power Administration; low bid $323,976.

100 tons, stringer bridge, Pittsfield, Mass., to Grinsser & Shlager Inc., Somerville, Mass.; Mackin Sand & Concrete Co., Greenfield, Mass., general contractor; 40 tons reinforcing to Joseph T. Ryerson & Son, Inc., Cambridge, Mass.

STRUCTURAL STEEL PENDING

2000 tons, Bronx General Hospital addition, New York; bids May 14.

1000 tons, superstructure, contract C-2c, Fitzgerald expressway, Boston; Bethlehem Steel Co., Bethlehem, Pa.; low $1,857,710.20.

American Bridge Division, U. S. Steel Co., Pittsburgh, $1,951,485.30.

1500 tons, Eastern Psychiatric Institute, Philadelphia, a state institution; bids May 14.

1976 tons, state bridge, Fayette county, Pennsylvania; bids May 9.

1721 tons, state bridge work, Northampton county, Pennsylvania; bids May 2; also 6130 linear feet of steel I-beam piles.

1000 tons, $6 million, 250-bed teaching hospital, University of Oregon, Portland, Oreg.; tonnage allocated by government for third quarter production; plans to be considered by board Apr. 21-22.

200 tons, state highway bridge, Manchester-Wenham, Mass., M. DeMatteo Construction Co., Quincy, Mass., low, $2,117,612.45; also 125 tons reinforcing bars.

125 tons, bus and transmission towers, power substation project; bids to Tacoma, Wash., Apr. 7.

REINFORCING BARS . . .

REINFORCING BARS PLACED

4000 tons, Albeni Falls dam power project, Pend Oreille river, Idaho, to Steel Constructors, Portland, Oreg.; Donovan-Foley-Winstoff-Lytle-James, St. Paul, Minn., base contract $8,607,246.

900 tons, Navy installation, Bangor, Wash., to Bethlehem Pacific Coast Steel Corp., Seattle.

400 tons, Army communications center, Kenai, Alaska, to Northwest Steel Rolling Mills Inc., Seattle; J. H. Pomeroy & Co., Seattle, general contract; low $6,472,000.

200 tons, addition to Marine hospital and sewage disposal plant, to Bethlehem Pacific Coast Steel Corp., Seattle.

130 tons, dining hall, University of Massachusetts, Amherst, Mass., to Fabricated Structural Products Co., Springfield, Mass.; Bathelt Construction Co., Holyoke, Mass., general contractor; Grinsser & Shlager Inc., Somerville, Mass., fabricated structural steel.

REINFORCING BARS PENDING

915 tons, Courtland canal, Bostwick Division, Missouri Basin project; bids Apr. 8 to Bureau of Reclamation, Superior, Nebr.

500 tons of mute, 600-man residence hall, University of Washington, Seattle; Strand & Son, Seattle, low $1,388,900.

350 tons, bridge substructure, Chicopee-West Springfield, Mass., Daniel O'Connell's Sons Inc., Holyoke, Mass., low.

325 tons, spillway and embankment, Jemez creek, N. Mex.; bids to Corps of Engineers, Albuquerque, N. Mex.

325 tons, state bridges, Stockbridge-West Stockbridge, Mass., J. F. White Contracting Co., Cambridge, Mass., low.

125 tons, spillway, Garza-Little Elm dam, Trinity river, Texas; bids Apr. 19, Corps of Engineers, Ft. Worth, Tex.

RAILS, CARS . . .

LOCOMOTIVES PLACED

Chicago & Northwestern System, 90 diesel-electric locomotive units, comprising 82 for the Chicago & Northwestern and 8 for the Chicago, St. Paul, Minneapolis & Omaha, orders for 62 were placed with the Electro-Motive Division, General Motors Corp., La Grange, Ill., 12 with Fairbanks Morse & Co., Chicago, 11 with the American Locomotive-General Electric Companies, Schenectady, N. Y., and 5 with the Baldwin-Lima-Hamilton Corp., Eddystone, Pa.

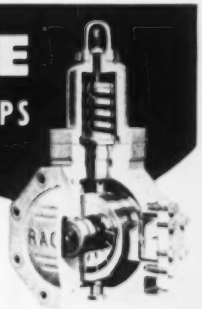
Georgia, one 1500-horsepower diesel-electric general purpose unit, to the Electro-Motive Division, General Motors Corp., La Grange, Ill.

Missouri-Kansas-Texas, 15 diesel-electric locomotives, awarded as follows: six 1500-horsepower road switching units, to Electro-Motive Division, General Motors Corp., La Grange, Ill.; five 1200-horsepower switching units and four 1600-horsepower road switching units, to the Baldwin-Lima-Hamilton Corp., Eddystone, Pa.

RAILROAD CARS PLACED

St. Louis Refrigerator Car Co., 200 steel sheathed 40-ton refrigerator cars, to Pressed Steel Car Co., Chicago.

RACINE
HYDRAULIC PUMPS



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RACINE "Variable Volume" Pumps eliminate relief valves and extra piping. They reduce horsepower requirements and avoid excessive heat losses. Over-all cost of motor and reservoir is usually reduced. Efficiency is high because RACINE Pumps "put all of the oil to work."

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Metalworking Briefs . . .

CONSTRUCTION—ENTERPRISE—ORGANIZATIONAL CHANGES

Ford Lays Ore Carrier Keel

Keel of Ford Motor Co.'s 647-foot ore carrier, *The William Clay Ford*, was laid Apr. 7 in the yards of Great Lakes Engineering Works, River Rouge, Mich. As the third and largest of the Ford ore carriers, the new ship is scheduled to be completed for start of the 1953 Great Lakes shipping season. The ship will have an overall length of 647 ft, a beam of 70 ft, capacity of 19,000 gross tons and will be powered by a 7000 hp oil-fired turbine. The ship will have a speed of 16 miles an hour.

Spencer Heads Lake Carriers

Vice Adm. Lyndon Spencer, U. S. Coast Guard (Ret.) was elected president of Lake Carriers' Association, Cleveland, succeeding John T. Hutchinson who resigned after a five-year term. It marked the first time in the association's history that the presidency was made a full time post.

Fabricant Suspends Project

Fabricant Steel Products Inc. halted construction of its steel plant in North Albany, N. Y. Apparently no decision has been made by the company as to whether it will proceed with the project. Plans called for erection of a $1 million plant.

Ziv Steel Opens Warehouse

Ziv Steel & Wire Co., Chicago, opened a tool steel warehouse at 1053 Custer Dr., Toledo, O. William P. Stead is manager of the new operation.

Erie Iron Buys Kettle Firm

Erie Iron & Supply Co., Erie, Pa., acquired the Bucyrus Kettle Co., Bucyrus, O., but will not continue operation of the Ohio plant. The plant, consisting of machinery and kettles as well as stainless steel and bar stock, will be liquidated.

Union Die Casting Expands

Union Die Casting Co. Ltd., Los Angeles, manufacturer of die castings and plumbing goods, is constructing additional plant facilities at 2313 E. 51st St., Vernon, Calif.

Plans $5 Million Plant

Sulphur Converting Corp., Quebec, Que., plans to build a $5 million sulphur plant at Roberval, Que. The project is well advanced. Land has been purchased in the Chibougamau region and plans have been made for mining of pyrite, an ore from which sulphur will be produced by a special process. The company, headed by J. A. Leclerc, Montreal, hopes to be able to start construction of the plant in May and reach the production stage by 1953.

Tool Firm Appoints Agent

Due to rapidly expanding demand for its products in the Orient, Tocco Division, Ohio Crankshaft Co., Cleveland, appointed Cosa Corp. as sales representative in the Far East. Frank Nobu, Cosa's Japanese representative, was for some years general manager of Machine Tool Division, Mitsui Bussan Maisha Ltd., the largest prewar importers of machine tools to Japan.

Jaybee Mfg. To Build

Jaybee Mfg. Corp., Los Angeles, manufacturer of builders' hardware, will construct a factory and office building at 566 San Fernando Rd., that city.

Taylor-Winfield Expands

Taylor-Winfield Co., Warren, O., is expanding its plant to enable it to increase production of metalworking machinery. The project includes construction of additions to its laboratory, office and plant and the installation of new equipment.

Lava Crucible Changes Name

Lava Crucible Co., Pittsburgh, changed its name to Lava Crucible-Refractories Co. to reflect its activities in the refractories field.

Will Build Chemical Plants

American Cyanamid Co., New York, organized a new subsidiary, Chemical Construction (Inter-American) Ltd., with offices in Toronto, Ont. The new firm will design and build chemical plants in all nations of the western hemisphere except in the United States. W. R. Geddes is president of the new company.

Heppenstall Names Agent

Heppenstall Co., Pittsburgh, appointed Edgar L. Fink Co., Detroit, as its representative for the sale of its metal cutting knives in Wayne county, Michigan.

Ceramic Programs Merged

Know-how of Ryan Aeronautical Co., San Diego, Calif., in making heat and corrosion resistant sheet metal parts and of California Metal Enameling Co., Los Angeles, in ceramics

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ALL STEEL GONDOLA CARS

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Each car is put into first class operating condition in Chicago Freight Car's own shop to assure long, trouble-free service.

GENERAL SPECIFICATIONS

Capacity, nominal 100,000 lbs.
Light weight, approx. 44,000 lbs. (aver.)
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Inside length 40 ft. 0 in.
Inside width 9 ft. 7 in.
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Cubic capacity 1552

Construction details available upon request.

Three Types of Bottoms Available

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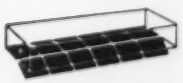
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INDUSTRY'S WORKSHOP FOR THE FINEST IN PLATING AND POLISHING PROCESSES • EQUIPMENT • SUPPLIES

production will be joined. The two firms announced a merger of their ceramics programs, together with an improved ceramic, A-418-Ryanco-C, which has been used for some time in production of aircraft components.

Tool Works Buys Equipment

Niagara Machine & Tool Works, Buffalo, is expending $500,000 for new plant equipment.

Reynolds Appoints Agents

Reynolds Metals Co., Louisville, appointed three new distributors. Vinson Supply Co., Dallas, and Vory's Bros. Inc., Columbus, O., will handle the general line of Reynolds aluminum mill products. G. A. Avril Smelting Corp., Cincinnati, will distribute ingot products only.

Aluminum Body To Expand

Aluminum Body Corp., Vernon, Calif., will construct a $150,000 factory in Montebello, Calif., including factory space, an office building and paint sheds.

Galvanizers Elect Officers

American Hot Dip Galvanizers Association Inc., Pittsburgh, elected the following officers: President, D. M. Hayes, Witcox, Crittenden & Co. Inc., Middletown, Conn.; 1st vice president, Frank W. Miller, Lehigh Structural Steel Co., Allentown, Pa.; 2nd vice president, T. R. Gregory, Thomas Gregory Galvanizing Works, Maspeth, N. Y.; secretary-treasurer, Stuart J. Swensson.

Cooper Enlarges Facilities

Cooper Precision Products, manufacturer of aircraft quality fastenings, 5621 W. Century Blvd., Los Angeles, is expanding warehouse facilities and adding manufacturing space.

More Research Work Planned

Outboard, Marine & Mfg. Co., Waukegan, Ill., is constructing a building in that city for research activities on outboard motors and other products. The company's research department will embark on many new projects that were impracticable previously because of lack of space.

Arcturus Mfg. Builds Plant

Arcturus Mfg. Corp. is constructing a $3.5 million drop-forge plant at the firm's present location at 4301 Lincoln Blvd., Venice, Calif. Facilities of the plant will include hammers weighing 16,000, 12,000 and 8000 pounds. The plant will cover an area of 30,000 square feet and will be ready to deliver large steel forgings within six to nine months.

Behr-Manning Plans Plant

Behr-Manning Corp., Albany, N. Y., will begin erection this summer of a $794,450 plant to replace an old structure. The project is scheduled to be completed late this year.

Specialloy Inc. Moves

Specialloy Inc., manufacturer of alloy addition agents and products, moved into a newly constructed plant at 4025 S. Keeler Ave., Chicago.

Culbertson Gets New Agency

B. E. Culbertson Co., Cincinnati, was appointed by United States Air Conditioning Corp. as its representative in Kentucky and southern Ohio. The Culbertson company also represents Rittling Corp., Buffalo; Taco Heaters Inc., Providence, R. I.; Durant International, Williamstown, N. J.

Buick Leases Office Space

Buick Motors Division, General Motors Corp., Detroit, leased space in the second of three office buildings being completed at 3440-50-60 Wilshire Blvd., Los Angeles.

Bone Engineering Expands

Bone Engineering Corp. is constructing a factory building at 701 W. Broadway, Glendale, Calif., for electronic and hydraulic research and development.

St. Louis Firm Gets Agency

Elwell-Parker Electric Co., Cleveland, appointed Conlon-Lightbody Co., St. Louis, as sales agent in that territory to handle sales of its industrial trucks, tractors and cranes.

Canadair Lifts Production

Canadair Ltd., Montreal, Que., is gearing its operations for a peak production of 2500 planes a year by 1953. The target set for the end of 1952 is 200 aircraft per month. Construction of jet fighters and trainers will dominate the production program.

Electronics Firm Expanding

West Coast Electronics Co., Los Angeles, started construction of a plant at 5873 W. Jefferson Blvd., that city, for manufacture of electronic equipment. Completion is scheduled by June.

National Gypsum Expands

National Gypsum Co., Niles, O., is expanding its plant in that city. The company spent $187,700 for installing equipment for producing aircraft steel landing mats and $170,000 for a plant addition to manu-

REPEAT APPLICATION

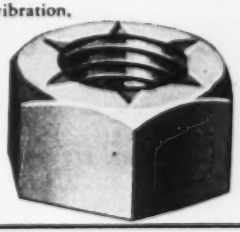
GRIPCO LOCK NUTS do not "lose their grip", can be removed and reapplied, over and over again without appreciable loss of locking effectiveness. Hold fast, every application, until removed with a wrench.

REPEAT SATISFACTION

Manufacturers who try Gripco Lock Nuts are so pleased with the way they "take hold" and "stay on the job", that they adopt them as standard on all their products. Applied fast, lock fast, hold fast!

GRIPCO LOCK NUT

. . . locking action resists vibration, strain, oil or chemicals.



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A production speeder. Pilot positions nut quickly and accurately and it is instantly attached by resistance welding.

GRIPCO COUNTERSINK WELD NUTS

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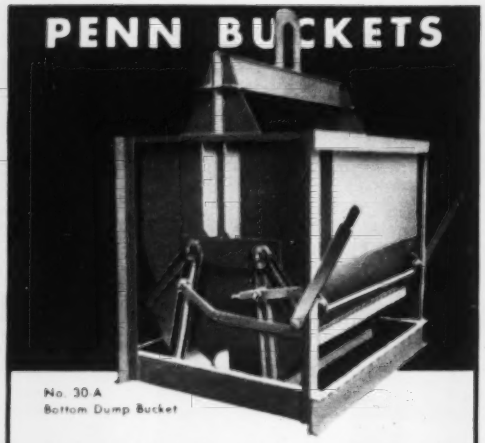

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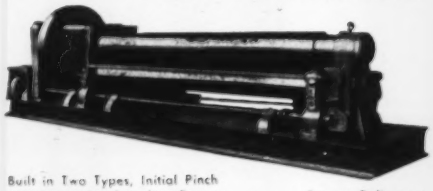

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Prompt Delivery on Standard Sizes

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All Webb Rolls are backed by continuous progress in the development of industrial machinery since 1881.

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More than 1200 tons of steel will form the four-lane, 10-span bridge which will cross the San Diego River Flood Control channel. Bethlehem Pacific Coast Steel Corp. is erecting the 1150-foot-long bridge which connects two of the California city's residential areas

facture test stands for aircraft engines.

Durant Expands Facilities

Durant Mfg. Co., manufacturer of counting and measuring machines, added 16,000 square feet to its plant in Milwaukee to provide space for new offices and plant production. Expansion in sales engineering services accompanies the increased manufacturing facilities.

Fisher, Rudge & Neblett

Fisher & Rudge, management consultant in labor and industrial relations, merged with Thomas F. Neblett, Los Angeles, to form the country's first national organization in this field. The firm established headquarters at 250 Park Ave., New York, and at 608 S. Hill St., Los Angeles.

AiResearch Expands Service

AiResearch Mfg. Co.'s customer service department moved to its own quarters in a building adjacent to Los Angeles International Airport. H. J. Summers continues to head this department. AiResearch is a division of Garrett Corp., Los Angeles.

Koehring Names Distributor

Koehring Co., Milwaukee, appointed Ruffridge-Johnson Equipment Co., Minneapolis, as its distributor in Minnesota. The firm will handle the complete line of Koehring heavy-duty construction equipment along with products of the three Koehring subsidiaries, C. S. Johnson Co., Champaign, Ill.; Parsons Co., Newton, Iowa; and Kwik-Mix Co., Port Washington, Wis.

Southwest Products Expands

Southwest Products Co., Pasadena, Calif., is constructing two buildings, containing 19,000 square feet of floor space, in Duarte, Calif. The company manufactures bearings and mechanical push-pull controls.

Ampco Appoints Distributor

Ampco Metal Inc., Milwaukee, appointed Kirk-Wicklund & Co., Kansas City, Mo., as a franchised distributor of the company's products, including electrodes, bare wire and filler rods.

Royal Metal Leases Quarters

Royal Metal Mfg. Co., Chicago, leased the second floor of the Knox building, 452 Fifth Ave., New York, and is converting the area into a showroom and sales headquarters. Hobart A. Green is president. The company manufactures metal furniture.

Pacific Metal Changes Name

Corporate name of Pacific Metal & Salvage Co. was changed to Gustav Co. with main offices at 630 Edmunds St., Seattle.

Thor Plans $1 Million Plant

Thor-Canadian Co. Ltd., Toronto, Ont., will erect a $1 million plant at Alderwood, Ont., with 100,000 square feet of floor space. The company sold its Toronto plant.

Ford Moves Branch Office

Ford Motor Co., Dearborn, Mich., moved its Washington office to Wyatt building, 14th street and New York avenue N.W.

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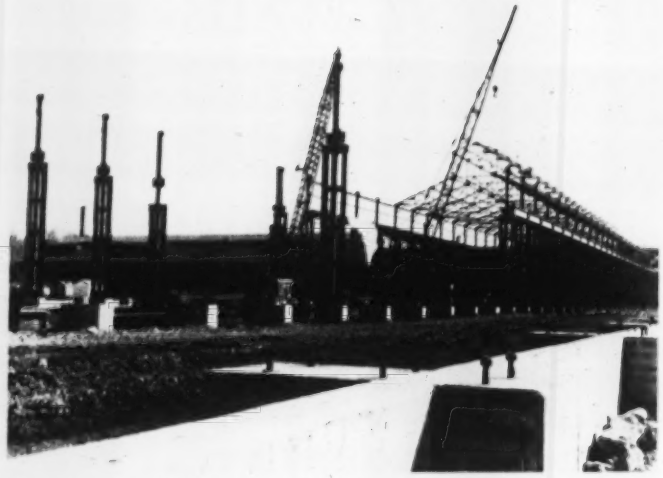

Skeleton Takes Shape for Pittsburgh Steel

As yet in the skeleton stage, these buildings will eventually house Pittsburgh Steel Co.'s hot and cold-rolled continuous sheet and strip mill at Allenport, Pa. The 66-inch 4-high hot sheet and strip mill will produce about 900,000 tons annually, and the 4-stand tandem cold sheet and strip mill 380,000 tons

How They Exceed Capacity

Institute explains why iron and steel furnaces can push operating rates beyond 100 per cent

IF GOVERNMENT seizure of the steel industry sticks, the ingot operating rate will soon return to 100 per cent of capacity or above. It slipped to 51 per cent last week.

How is capacity figured? How can steel ingot production exceed capacity?

The Why of It—Steel capacity is the "rated" potential of facilities to produce, based on past experience. Improvement in materials and practices can produce results that surpass those experienced in the past and the industry can produce at above 100 per cent of capacity. What's more, new production facilities can be put to use before they are officially included in the industry's rated capacity.

In explaining how steel ingot production can exceed capacity and how the capacity of the iron and steel industry's furnaces is established, the American Iron & Steel Institute breaks the subject into two parts: Blast furnaces; steelmaking furnaces.

Blast Furnaces—The rated capacity of a blast furnace to produce pig iron is determined not only by the pertinent factors of physical dimensions or character of the furnace, but also by the character of the materials available in the area of the furnace.

First, the maximum production at full operation is determined. The annual rated capacity is this rate of production extended for the expected actual operating time over a year. For new furnaces the initial capacity is based on past experience of comparable furnaces operating with similar raw materials and under similar conditions.

Steelmaking Furnaces—The annual rated capacity of a steelmaking furnace is based on the previous performance of a full year of continuous operation of each group of furnaces, referred to as a "shop." For new furnaces the initial capacity is based on past experience, under similar conditions.

The rated capacity of blast furnaces and steelmaking furnaces makes allowance for a certain amount of nonproductive time, such as for relining and rebuilding. This allowance is not a standard figure.

Subject to Change — If conditions, materials and type of product change sufficiently to warrant an increase or decrease of rated capacity this change is made at the time the annual review of capacities is made by the American Iron & Steel Institute.

Use of new facilities before they are officially incorporated into the country's capacity figures has in the last year and a half been a bigger factor than usual in pushing steel operating rates over capacity. In this period, a large amount of new capacity has come into being. The second-quarter capacity of the steel industry this year is 631,000 tons larger than that of the first quarter, but the first-quarter capacity figure will continue to be used in calculating percentage rates of operation until another complete survey of actual capacity is made.

Newest Score on Steel Capacity

Steelmaking capacity in the United States at the beginning of the second quarter of this year is estimated at 109,218,670 net tons annually.

This estimate, by American Iron & Steel Institute, is based on a previously scheduled increase of 631,000 tons in the first quarter.

Operating rates announced each week by the institute will continue, however, to be based on the annual capacity of 108,587,670 tons as of Jan. 1, 1952, the latest complete survey of actual capacity. Consequently, full operations would produce an operating rate above 100 per cent of capacity.

Scheduled addition to capacity in the second quarter is 2,919,600 tons, with 3,214,300 planned for the third quarter and 1,688,800 tons for the fourth quarter.

The total increase in annual capacity in 1952 is scheduled at 8,453,700 tons, making the country's planned capacity at the beginning of next year 117,041,370 tons.

Furnace Gas Fires Boiler

Blast furnace gas will be utilized to fire a new high pressure boiler being installed at Weirton Steel Co., Weirton, W. Va. Designed for a steam capacity of 350,000 pounds per hour at a normal rating of 850 psi, the unit will also be equipped to burn pulverized fuel and coke oven gas as well.

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SALES REPRESENTATIVE WANTED. Cold rolled strip steel specialty mill seeking experienced salesman for Chicago metropolitan area. Excellent opportunity. Write Box 483, STEEL, Penton Bldg., Cleveland 13, Ohio.

TOOL AND DIE ENGINEER. Philadelphia Shop serving major industrial accounts throughout the East urgently requires the services of a qualified engineer with heavy design experience in progressive and compound dies. Should have shop experience combined with engineering degree while age is no barrier for the right man who can find substantial starting salary and excellent long range opportunity. Complete resume requested. Write Box 476, STEEL, Penton Bldg., Cleveland 13, O.

WANTED — TOOL STEEL SALESMAN—Young man for Chicago area. Ziv Steel & Wire Company, Chicago, Illinois.

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FORGING ENGINEER—Technical & practical—experienced in all lines including aircraft, munitions, automotive, and locomotive ferrous and non-ferrous forgings. Available. Write Box 482, STEEL, Penton Bldg., Cleveland 13, Ohio.

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aetna-standard completes two-year expansion program

• The two-year expansion program gives Aetna-Standard additional facilities to meet delivery schedules for tube mills, flat-rolled equipment, wire-drawing products, drawbenches and other machinery for the metal industry.

At the big Ellwood City plant . . . a new Roll Foundry features foundry handling equipment and many innovations. Additional assembly and machine shop capacity has been added, augmented by many new machine tools. Executive offices are now located in the Frick Building, Pittsburgh, Pa. . . . General Offices in Ellwood City.

Aetna-Standard recently completed 50 years of Creative Engineering service to the ferrous and non-ferrous industries and looks forward with confidence to another fifty.

BUYS RUBBER & PLASTICS MACHINERY DIVISION OF National-Erie

The facilities of the Warren, Ohio, plant will be used primarily for the production of machinery for the rubber industry. Aetna-Standard has purchased the patterns, drawings and some machinery of the rubber and plastic products division of the National-Erie Corporation, Erie, Pa., subsidiary of Bucyrus-Erie Company.

ASSOCIATED COMPANIES

Head Wrightson Machine Company, Ltd., Middlesbrough, England — Great Britain, Finland, Sweden, Norway, Denmark, Union of South Africa, Northern and Southern Rhodesia.

Aetna-Standard Engineering Company, Ltd., Toronto, Ontario, Canada.

M. Castellvi, Inc., New York, N. Y. — Mexico, Central and South America.

Societe de Constructions de Monthard, Paris, France — France, Belgium, Holland, Luxembourg, Switzerland.

Demag Aktiengesellschaft, Duisburg, Germany — Germany, Austria, Yugoslavia, Greece, Turkey, Egypt.

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